Comparison of Dental and Alveolar Arch Widths of Patients with Class II division 1 Malocclusion and Subjects with Class I Normal Occlusion of Iraqi Sample Aged (14-24) in Hilla city

Thair Jaber Al-Khafagi Zainab Mohy AL-Fatlawy
University Of Babylon College Of Dentistry

Abstract:
The size and shape of the arches have considerable implications in orthodontics diagnosis and treatment planning, affecting the space available, dental esthetics, and stability of the dentition. From the dental cast, one can analyze tooth size and shape, alignment and rotations of the teeth, presence or absence of teeth, arch form and symmetry, and arch width and occlusal relationship. This study was performed using dental casts for upper and lower arches of a total of 38 subjects with class II, division 1 malocclusions (17 males and 21 females) and of 40 normal class I subjects (20 males and 20 females) of Iraqi adult samples aged (14-24) in Hilla city. The dental and arch width dimensions measured were intercanine, intermolar, and molar alveolar in both arches to compare the transverse dimensions of the dental and alveolar arches of class II malocclusion groups with normal class I occlusion subjects and independent-samples t-test was applied for comparisons of the groups.

The finding from this investigated indicated that, (1) there were no significantly differences in all measurements between class I and class II overall samples (2) there were no significantly differences in all measurements between class I and class II male samples except for mandibular inter canine widths (L3-3) were significantly larger in class II than in class I male samples (3) there were no significantly differences in all measurements between class I and class II female samples except for mandibular molar alveolar widths (LA6-6) were significantly larger in class II than in class I female samples (4) most of the dental and alveolar widths measurements in overall, male and female class II samples were insignificantly slightly larger than in class I overall, male and female samples. These indicates that there were no posterior crossbite tendency in the class II groups.

الخلاصة:
إن حجم وشكل الفكين لهما دور كبير في تشخيص وطرق العلاج في تقييم الأسنان ويؤثر على الفضاء المتوفر وجمالية الأسنان واستقرار الأسنان. ومن خلال قوالب الأسنان يمكن أن ن Evaluate حجم وشكل الأسنان ووضع الأسنان ووجود أو غياب الأسنان بشكل وتساوير الفكين وعرض الفكين والعلاقة الالتباسية للفكين. هذه الدراسة تم باستعمال قوالب الأسنان للفكين الأعلى والأقل لمجموع (38) شخص للصف الثاني، و (17 ذكر و 21 أنثى) و (40) شخص للصف الأول للإطليط الطبيعي (20 ذكر و 20 أنثى) من عينة العراقيين البالغين أعمارهم (14-24) سنة في مدينة الحلة. إن أبعاد الأسنان والفكين الموصلة كانت لما بين الأسنان وما بين الأضراس وما بين الحويصلي الضري وفاكنتا الفكين لمسافة الأبعاد المستعرة لأسنان وحويصلي الفكي للصف الثاني من سواء
Introduction

Information concerning the upper and lower arches dimensions in human populations are important to clinical orthodontic diagnosis and treatment planning (1, 2). Investigators have studied the growth of arch widths in persons with normal occlusion, arch widths in adults with normal occlusion, and compared these values with those of different malocclusion samples, however, there is considerable controversy among the results presented in the literature (3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18). The results reported by Tollaro et al (11) were from II-1 children with posterior transverse interarch discrepancy. Bishara et al(12) compared interarch differences in intercanine and intermolar widths cross-sectionally in children and found similarity between II-1 and normal occlusions. In male patients only, longitudinal curves based on interarch differences had a greater magnitude in normal occlusions than in II-1(12). One adult study found that normal occlusion male patients had larger arch widths than female patients for five of six arch widths, whereas II-1 male patients had larger widths than female patients for only maxillary and mandibular alveolar widths. One adult study found that normal occlusion male patients had larger arch widths than female patients for five of six arch widths, whereas II-1 male patients had larger widths than female patients for only maxillary and mandibular alveolar widths(8). Uysal et al findings that the maxillary interpremolar width, maxillary canine, premolar and molar alveolar widths, and mandibular premolar and molar alveolar widths were significantly narrower in subjects with Class II division 1 malocclusion than in the normal occlusion sample, maxillary molar teeth in subjects with Class II division 1 malocclusions tend to incline to the buccal to compensate the insufficient alveolar base(4). The literature review indicates that the width of the dental arches in subjects with Class II, Division 1 mal occlusions was found to be either normal or narrower than the corresponding widths of normal subjects. Such a discrepancy may be attributed to
differences in the absolute size of the dental arches in the various Class II samples compared (12). A more relevant approach is to calculate and compare the differences between the maxillary and the mandibular arch widths in subjects with Class II, Division I malocclusions and normal subjects (8) . Huth, et al. who studies subjects of white Americans with no history of orthodontic treatment which compare arch widths in adults with Class II division 2 (II-2), Class II division 1 (II-1), and Class I normal occlusions all groups had similar mandibular intercanine and alveolar widths. The Class II division 2 and Class II division 1 groups had similar mandibular intermolar widths, both smaller than normal occlusions. The Class II division 2 and Class II division 1 groups had similar maxillary/mandibular differences in intercanine and alveolar widths, both smaller than normal occlusions(19). Furthermore, it would be of interest to determine whether the tendency for a transverse discrepancy found in the adult Class II dentition is also expressed in the earlier stages of dental arch development. The literature review indicates that when comparing Class II and normal occlusions, gender differences appear to be important. Therefore, both gender and gender pooled comparisons were made in this study. The objectives of this study were to determined the differences between the transverse dimensions of the dental arches and alveolar widths of Class II division 1 malocclusion groups with the transverse measurements of untreated normal occlusion subjects in over all samples and with in each sex. Another objective was to develop norms for adult arch widths using data from the Class I normal subjects.

Materials and Methods

All subjects were Iraqi adult sample with no orthodontic treatment. Records for 78 subjects included plaster casts with fully erupted permanent incisors, canines, premolars, and first molars. Lateral cephalograms were available for all . A sample of 40 subjects, 20 male and 20 female, with Class I normal occlusion was selected from the Department of Orthodontics in the college of dentistry of Babylon university and specialized center of orthodontic in Hilla city. the following inclusion criteria were used to collect this sample(21, 22, 4, 19) : (1) teeth well aligned within the dental arches with less than 3 mm of crowding or spacing, (2) overjet not more than 4 mm (3) first molars bilaterally Class I in centric occlusion, (4) no teeth in crossbite, (5) normal growth and development, (6) all teeth present except third molars, (7) good facial symmetry determined clinically, (8) no significant medical history, and (9) no
history of trauma, and no previous orthodontic, prosthodontic treatment, maxillofacial or plastic surgery. A sample of 38 Class II division 1 subjects, 17 male and 21 female, was selected from the records of patients who were came to the Department of Orthodontics in the college of dentistry of Babylon university and specialized center of orthodontic in Hilla city. The following inclusion criteria were used to select this sample (21, 23, 22, 24, 25) : (1) maxillary incisors labially inclined, (2) overjet greater than 7.5 mm, and (3) first molars bilaterally full Class II in centric occlusion. (4) no significant medical history; and (5) no history of trauma, and no previous orthodontic, prosthodontic treatment, maxillofacial or plastic surgery. The minimum age of the subjects chosen for this study was based on earlier evidence reporting no significant change in first molar and canine arch widths after age 13 in girls and age 16 in boys. Six arch width measurements were taken with dial calipers on the dental casts of each subject: (12, 26, 2, 4, 19)

(1) maxillary intercanine width between the cusp tips, (U 3-3)
(2) maxillary intermolar width between the tips of the mesiobuccal cusps of the first molars (U6-6).
(3) maxillary molar alveolar width at the mucogingival junctions above the mesiobuccal cusp tips of the first molars (UA 6-6).
(4) mandibular molar alveolar width at the mucogingival junctions below the buccal grooves of the first molars (LA6-6).
(5) mandibular intermolar width between points on the main buccal grooves located vertically at the middle of the buccal surfaces of the first molars(L 6-6).
(6) mandibular intercanine width between the cusp tips (L 3-3) (Figure 1).

Arch widths were measured with a dial calipers to the nearest 0.05 mm. Two measurements were taken at separate times for each variable measured. The intra-examiner correlations between first and second measurements for the six variables ranged from $r = .95$ to $r = .98$. The average of the first and second measurements was used for data analysis. Interexaminer correlations averaged $r = .93$. Computer software SPss © Vs. 12.0 (statistical package for the Social Science, Inc. 1989-2003 Copyright) was used to analyze the statistical data obtained from this study. Descriptive statistics were computed and the Independent-samples t-test was applied to compare the transverse dimensions of the dental arches and alveolar widths of Class II division 1 malocclusion groups.
with the transverse measurements of untreated normal occlusion subjects in over all samples and with in each sex.

**Aims of the study to determine**

(1) the dental and alveolar arch widths in normal occlusion and in class II division 1 malocclusion.

(2) the differences in the dental and alveolar arch widths between:-

(a) Class I and class II division 1 malocclusion in overall samples.

(b) Class I and class II division 1 malocclusion with each sex.

**Results**

The sample of this study is 78 subject consisting of 40 class I mean age (21 years), 20 males the mean age (20.86 years) and 20 females the mean age (21.22 years) and 38 class II division 1 the mean age (19.3 years), 17 males the mean age (19.71 years) and 21 females the mean age (19.07 years) as demonstrated in Table (1). The descriptive statistic, including mean, standard deviations, minimum and maximum value of all variables for the total sample of class I and C1 II division 1, both the males and female group of class I
and class II division I are present in tables (2), (3), (4).

**Comparison of the dental and alveolar arch widths measurements between normal class I and class II overall samples**: (Table 2)
The comparison of measurements between normal class I and class II overall samples demonstrated in table (2). All measurement were larger in class II sample than in class I sample except for upper intermolar width were larger in class I than in class II sample, however, these differences are very small in magnitude. For normal class I and class II, there were no statistically significant difference for the all measurements at P > 0.05.

**Comparison of the dental and alveolar arch widths measurements between normal class I and class II male samples**: (Table 3)
The comparison of measurements between normal class I and class II male samples demonstrated in table (3), indicated that there were no significant differences between them except for the lower intercanine widths (L3-3) were significantly larger in class II than in normal class I male samples at P < 0.05. All measurement were larger in class II than in class I male sample except for upper intermolar width were slightly larger in class I than in class II sample but these differences were not significant at P > 0.05.

**Comparison of the dental and alveolar arch widths measurements between normal class I and class II female samples**: (Table 4)
The comparison of measurements between normal class I and class II female samples demonstrated in table (4) indicated that all measurements were larger in class II than in class I females sample except for upper molar alveolar width were slightly larger in class I than in class II females sample. But these differences were not significant at P > 0.05. Except for the lower molar alveolar width (LA6-6) were significantly larger in class II than in class I female sample at P < 0.05.

**Discussion**
Study and determination of criterion for different ethnic groups is essential to promote accurate diagnosis and planning for orthodontic treatment. Each ethnic group has certain characteristics that should not be taken as standards for other areas with different developmental and ecological foundation (27). So the differences that have been observed in this study of arch width in class I & class II with the findings of other studies may be
attributed to the following factors [Ethnic variations, sample size, method of study, age of subjects and gender dimorphism]

In spite of many studies in Iraq deal with these measurements, the present study adds new information about the dental and alveolar arch widths in class I normal occlusion and class II malocclusion. The measurements, that available in the present study are specified for age and sex for Iraqi population in Hilla city in an attempt to provide a data for orthodontic diagnosis and treatment planning.

Investigators who studied growth changes in the transverse arch width found that molar and canine arch widths did not change after age 13 in female subjects and age 16 in male subjects (2,7). The minimum ages of the subjects measured in this study were chosen on the basis of these previous studies. Therefore, we assumed that the arch widths of the subjects studied were fully developed. In the normal occlusion sample only subjects with minor or no crowding were included, whereas the absence of crowding was not a criterion in the class II groups. If a class I group with crowding would be compared with a class I group without crowding, most probably narrower arches would be found in the class I group with crowding. For that reason, group differences in this study may be the result of differences concerning crowding as well and our results must be interpreted carefully.

**Comparison between overall sample class I and class II**

Generally the comparison of measurements between overall class II and class I samples is present in table (2).

(I) Maxillary dental and alveolar arch widths:

Were no significant differences are found in maxillary intercanine widths(U3-3) between overall sample normal class I and overall sample class II at P>0.05, this finding in agreement with the finding of (4, 5, 10, 12), but in contrasting to the finding of (8, 3) which reported that subjects with normal occlusion had larger maxillary inter canine widths than the class II malocclusion subjects.

The maxillary intermolar width (U6-6) in this present study are no significant differences between class I and class II samples at P > 0.05, this finding are similar to the finding of (5, 19) but this finding are disagree with (3, 11, 8, 10, 19) who found that the maxillary intermolar width were significantly larger in class I than in class II overall sample and also disagree with the finding of (4) who found that the maxillary intermolar width were
significantly larger in class II than in class I overall sample.

The maxillary molar alveolar width (UA6-6) in this present study were no significant differences between class I and class II overall sample at P > 0.05 on the other hand, this measurement was significantly larger in class I than in class II overall sample (19, 4).

(II) Mandibular dental and alveolar arch widths:
In this present study, there are no significant differences were found in mandibular intercanine width (L3-3) between class I and class II overall sample at P>0.05, this finding were similar to the finding of (19, 3, 5, 12, 8) but disagree with the finding of (4,10) who founds that mandibular intercanine widths were significantly larger in the class II than in class I overall sample. The mandibular intermolar width (L6-6) in this present study are no significant differences between class I and class II overall sample at P > 0.05 as similar to the finding of (5 , 11) but in contrasting to the finding of (3 , 19) who founds that the mandibular intermolar width were significantly larger in class I than in class II overall sample , and also disagree with the result of (4) who reported that intermolar width were larger in patients with class II were compared with the class I overall samples. The mandibular molar alveolar width (LA6-6) in this present study are no significant differences between class I and class II overall sample at P > 0.05, this result comes in accordance with (19) but disagree with the finding of (4) who founds that the mandibular molar alveolar widths were significantly narrower in class II than in class I overall sample.

Comparison between Class I and Class II Male samples

Generally the comparison of the measurements between class I and class II male samples is present in table (3).

(I) Maxillary dental and alveolar arch widths:
In this present study, there are no significantly differences are found in maxillary inter canine width (U3-3) between male samples of class I and class II at P > 0.05 this finding are in contracting to the finding of (19, 8, 9) which founded that subjects with normal occlusion had larger maxillary intercanine widths than class II malocclusion subjects. The maxillary intermolar width (U6-6) in this present study are no significantly differences between class I and class II male samples at P > 0.05 this finding are in in accordance with (19, 8, 9, 6, 7) which founded that subjects with normal occlusion had larger maxillary intermolar widths than class II malocclusion subjects. The
maxillary molar alveolar width (UA6-6) in this present study are no significantly differences between class I and class II male samples at P > 0.05, this finding are in contrasting with the finding of (19, 8) who found that subjects with class I normal occlusion had larger maxillary molar alveolar widths (UA6-6) than class II malocclusion subjects.

(II) Mandibular dental and alveolar arch widths:
In this present study, the mandibular intercanine widths (L3-3) are found to be significantly larger in class II than in class I male samples at P > 0.05, but it differs from the findings of (19, 8) on there comparison between class I and class II male samples in which no significant difference was observed in regards to the mandibular intercanine widths (L3-3). The mandibular intermolar widths (L6-6) in this present study are no significantly differences between class I and class II male samples at P > 0.05, this finding are supported by the (9, 6, 7). But it differs from the finding of (19, 8, 6, 11) in which the mandibular intermolar width (L6-6) were significantly larger in class I than class II male samples. The mandibular molar alveolar width (LA6-6) in this present study are no significantly differences between class I and class II male samples at P > 0.05, this finding are supported by the (19) but disagree with finding of (8) who found that the mandibular molar alveolar width (LA6-6) were significantly larger in class I than class II male samples.

Comparison between class I and class II Female samples
Generally the comparison of the measurements between class I and class II female samples is present in table (4).

(I)Maxillary dental and alveolar arch widths:
In this present study, there are no significantly differences are found in maxillary inter canine width (U3-3) between female samples of class I and class II at P > 0.05. This finding are similar to the finding of (19, 10) but disagree with the finding of (8, 9) who founds that the maxillary intercanine width (U3-3) were larger in class I than in class II female samples. In this present study there are no significantly differences between class I and class II female samples in the maxillary intermolar width (U6-6) at P > 0.05. Conversely (19, 8, 10, 9, 7), stated that the maxillary intermolar width (U6-6) were larger in class I than in class II female samples. The maxillary molar alveolar widths (UA6-6) in this present study are no significantly differences between class I and class II female samples at P > 0.05, this finding are supported by (10) but disagree with
(19, 8) who stated that the maxillary molar alveolar widths (UA6-6) were larger in class I than in class II female samples.

(1) Mandibular dental and alveolar arch widths:
The mandibular intercanine width (L3-3) in this present study are no significantly differences between class I and class II female samples at P > 0.05. This finding are agree with the finding of (19, 8) but disagree with the finding of (10) who found that the mandibular intercanine width were larger in class II than in class I female samples. The mandibular intermolar width (L6-6) in this present study are no significantly differences between class I and class II female samples at P > 0.05. This finding are supported by finding of (8, 10, 7) but this finding in contracting with (19, 9) that the mandibular intermolar width (L6-6) were larger in class I than in class II female samples. The mandibular molar alveolar widths (UA6-6) in this present study are significantly larger in class II than in class I female sample at P < 0.05, this finding are disagree with (19, 8, 10) that the mandibular molar alveolar width (LA6-6) were no significantly differences between class I and class II female samples.

Conclusion
1- There were no significantly differences in all measurements between class I and class II overall samples.
2- There were no significantly differences in all measurements between class I and class II male samples except for mandibular intercanine widths (L3-3) were significantly larger in class II than in class I male samples.
3- There were no significantly differences in all measurements between class I and class II female samples except for mandibular molar alveolar widths (LA6-6) were significantly larger in class II than in class I female samples.
4- Most of the dental and alveolar widths measurements in overall, male and female class II samples were insignificantly slightly larger than in class I overall, male and female samples. These indicates that there were no posterior crossbite tendency in the class II groups.
References

2. Al-Zubair N.M.M. Maxillary and mandibular dental arch dimensions and forms in a sample of Yemeni population aged (18-26) years with class I normal occlusion. 2002; Master Thesis, Baghdad University.


27. Borgan E. Dental arch dimensions analysis among Jordanian school children. 2001; Master Thesis. Cairo University-Egypt
Table (1) The Distribution of Age in years of Class I and Class II samples

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<tr>
<th>Sample</th>
<th>Class</th>
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<th>S.D.Y</th>
<th>Maximum. Y</th>
<th>Minimum. Y</th>
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</table>

C1 I = class I;  C1 II = class II,  
S.D = standard deviation.  
No. of class I= 40(males= 20 and females= 20)  
No. of class II = 38 (males= 17 and females= 21) , Y = years

Table (2) Descriptive statistics of the dental and alveolar arch widths measurements in millimeters and t-test between overall samples of class I and class II

<table>
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<tr>
<th>Dimensions</th>
<th>Class</th>
<th>Mean</th>
<th>S.D</th>
<th>Maximum</th>
<th>Minimum</th>
<th>P- Value</th>
<th>Sig. *</th>
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<tr>
<td>U 3-3</td>
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<td>34.99</td>
<td>1.99</td>
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C1 I = class I;  C1 II = class II;  
S.D = standard deviation,  
N.S= not significant at P > 0.05,  
No. of overall class I sample = (40) (20 males and 20 females),  
No. of overall class II sample = (38) (17 males and 21 females)
Table (3) Descriptive statistics of the dental and alveolar arch widths measurements in millimeters and $t$- test between males samples of class I and class II

<table>
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<tr>
<th>Dimensions</th>
<th>Class</th>
<th>Mean</th>
<th>S.D</th>
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<th>Minimum</th>
<th>P- Value</th>
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C1 I = class I;  C1 II = class II;  S.D = standard deviation

*N.S= not significant,
S= significant  at $P < 0.05$

No. of males class I sample = 20
No. of males class II sample = 17
Table (4) Descriptive statistics of the dental and alveolar arch widths measurements in millimeters and $t$- test between females samples of class I and class II

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C1 I = class I; C1 II = class II;
S.D = standard deviation
*N.S= not significant,
S= significant at P < 0.05
No. of females class I sample = 20.
No. of females class II sample = 21
Abstract

The perfect example for microorganisms which resist heavy metals is *Pseudomonas aeruginosa*, it has a good ability to resist and accumulate different metal ions. This article studied the resistance ability of *P. aeruginosa* against different concentrations of the following metal compounds:

(HgCl, MgSO₄, Zn₂O₃, MgCO₃, Na₂SO₄, C₁₀H₂₀O, EDTA, NiSO₄, CuCl₂ and CdCl₂), and describing the role of these metals to influence the production of bacterial pigments.

Introduction

*Pseudomonas aeruginosa* has a very simple nutritional requirements. It possesses the metabolic versatility and often observed "growing in distilled water" which is evidence of its minimal nutritional needs(1). Organic growth factors not required and it can use more than seventy-five organic compounds for growth(2). It is tolerant to a wide variety of physical conditions, including temperature, and resistant to high concentrations of salts, dyes, weak antiseptics, many commonly used antibiotic and most of heavy metals (1).
When the bacteria faces a high concentration of any heavy metal which is accumulated by unspecific system ,the specific heavy metal ion is transported into the cytoplasm in spite of its high concentration , because these unspecific transporters are constitutively expressed .Thus , the gate cannot be closed(2).

This " open gate " is the first reason why heavy metal ions are toxic to a lot of microorganisms (2). Inside the cell, especially heavy metal cations with high atomic numbers tend to bind to SH groups , e.g. Hg$^{+2}$, Cd$^{+2}$ and Ag$^{+}$

Other heavy metal cations may interact with physiological ions such as Cd$^{+2}$ with Zn$^{2+}$, Ca$^{+2}$, Ni$^{+2}$, Co$^{+2}$ with Fe$^{+2}$ and Zn$^{2+}$ with Mg$^{+2}$, thereby inhibiting the function of the respective physiological cation . Heavy metal cations may bind to glutathione , the resulting bis-glutathionocomplexes tend to react with molecular oxygen to oxidized bis-glutathione GS-GS (3). Since the oxidized bis-glutathione has to be reduced again in a NADPH-dependent reaction and the metal cations immediately catches another two glutathione molecules , heavy metal cations cause a considerable oxidative stress(4).

All these ways and may be others are the reasons of heavy metals toxification , while In the case of P. aeruginosa , this bacteria have three possible mechanisms for a heavy metals resistance system.

Firstly, the accumulation of the specified ion can be diminished , not by interference with uptake but by active extrusion of the heavy metal ion from the cells , this mechanism is specific only Pseudomonas spp. (4).

Secondly, cations especially the "Sulfur lovers" can be segregated in to complex compounds by thiol- containing molecules and then ejected from the cell .

Thirdly, some metal ions may be reduced to a less toxic oxidative state by the complex enzymes and special oxidation mechanisms in the cells .

Finally, for many metals , resistance and homoeostasis is a combination of two or three of the mentioned basic mechanisms that is the case which P. aeruginosa success (4).

P. aeruginosa produce an extracellular compound with yellowish green fluorescence, called Pyoverdin, which functions as a byproduct.

The production of Pyoverdin, formerly called fluorescein, is concomitant with the production of another byproduct, Pyochelin (5).

Pseudomonas aeruginosa produce other types of soluble pigments, the blue pigment pyocyanin . (1) demonstrated that , the production of pyocyanin pigment abundantly in media of low-iron content.
and it have a functions in iron metabolism of bacterium.

**Materials and Methods**

*P. aeruginosa* isolated from wastewater in Basrah and diagnosed according to (6). Nutrient agar media used as a stage to growth bacteria with heavy metal. Different of heavy metal concentrations were prepared by dissolving of:

HgCl, MgSO4, Zn2O3, MgCO3, C10H20O, EDTA, NiSO4, CuCl2, CdCl2 in deionizer water to have a certain concentrations.

**Concentrations of heavy metals:**

(0.02M, 0.05M, 0.1M, 0.15M, 0.2M) for each heavy metals, prepared by using of molarities value according to (6).

**Demonstration resistant of bacteria to heavy metals:**

By using of filter paper disk technique, filter papers saturated with heavy metal solution for 30 minutes (6).

**Test the alteration of bacterial ability to produce pigments:**

To investigate the role of heavy metal in pigment production from bacteria, 12 tubes were used.

Ten tubes, each tubes have 0.2M of each heavy metals and determinant amount (0.1 ml of *P. aeruginosa* at 18 h.) of bacterial culture, then by spectrophotometer, the color of media was measured after incubation at 18,24,48h. respectively.

A control tube containing bacterial culture with out heavy metals was incubated ,then by spectrophotometer, the color of media was measured after incubation at 18,24,48h. respectively.

A first control tube was contained only nutrient broth.

There are 12 tube classified as a following:

- One tube as a control containing Nutrient broth.
- One tube has a broth culture media of *P. aeruginosa* incubated during 18,24,48 h.
- Ten tubes, each tube has broth culture media of *P. aeruginosa* with one of tenth heavy metals(subject of study)
- Spectrophotometer was used to detect the alteration of pigment production in broth media.

**Results and Discussion**

1- **Bacterial resistance to heavy metals:**

Table (1) shows that the bacteria *P. aeruginosa* was resisted most concentration of the heavy metal discs.

In the case of HgCl ,the results were referred to resistance of bacteria to four of fifth of concentrations used in study, the Minimal Inhibitory Concentration (MIC) of HgCl was 0.3 M , and the inhibition zone in the concentration 0.4M was 6 mm.

In the case of CdCl2, the (MIC) was 0.2M, and the inhibition zones were 11,7,7 mm for 0.2,0.3,0.4 M respectively.
In all other case, the bacteria was appeared a good ability to resist other heavy metals except the concentration 0.4M of CuCl2 was appeared about 7 mm as inhibition zone, we can see all these result in table (1)

From all the obtained results, it was concluded that P. aeruginosa have one or more mechanisms to resist these heavy metals. (4) have been demonstrated that the bacteria have three mechanisms for a heavy metal resistance system, these mechanisms were referenced in the introduction.

In the case of Hg+, P. aeruginosa is able to reduce Hg+ to the metal and this metal dose not remain inside the cell with the potential to extrusion of the heavy metal ion from cell according to (3).

The researchers have been demonstrated that the bacteria have an ability to detoxified Hg+, Mg+, Zn+, Cu+ by reduction, and the prevent toxic effects of these metal by transported into the cell with specific uptake system (7).

Most type of bacteria may be inhibited by increasing the concentration of MgSO4, Na2SO4, similar results were obtained with, Zn2O3 and NiSO4 because of there toxification with increasing concentrations (8), but in the case of P. aeruginosa, the synthesis of polysaccharide by P. aeruginosa may require MgSO4 and Na2SO4 for full expression, and stimulation of polysaccharide synthesis by MgSO4 and Na2SO4 was not limited in this bacteria, other salts Zn2O3, NiSO4 have high affinity in the metabolism of cell (2) referred to importance of these salts in variety of enzymes and DNA-binding protein such Zn+, and Ni is very important in the CorA system in bacteria.

More than one reports referred to a physiological importance of these salts (MgSo4, Zn2O3, MgCO3, NiSO4, CuCl2, Na2SO4) for P. aeruginosa and its activities, such these results obtained by (9, 10, 11, 2).

Accordingly, the results lead to suggest that the metals (C10H20O and EDTA, MgSO4, MgCO3, Zn2O3, NiSO4, Na2SO4) have no effect on the bacteria, and that mean the bacteria have ability to resist these mater by later mechanisms.

2-The alteration of bacterial ability to produce pigment

By absorption spectra were obtained by using of PERKIN ELMER MODEL 124 spectrophotometer. The absorbance of media contained bacteria with heavy metal was calculated in 600 nm after three incubation times 18, 24, 48 h., and compared with control containing broth culture media without heavy metal also after three times. The Table (2) and figure(1) have been reported that these results:
Some of heavy metals have a good ability to induce bacteria to produce the pigment (green pigment Pyoverdin) such of these heavy metals, NiSO4, MgSO4, MgCO3, Zn2O3, Na2SO4. In the Case of NiSO4, when the results were compared with the control (with out heavy metals), three time of incubation lead to increase the absorbance values, after 18h. the absorbance was increased from 0.054μm to 0.33μm, and after 24h. and 48h., the results were increased reaching to 0.4 to 0.45 μm respectively.

According to these results, all metals have a good ability to increase pigment production during incubation times. (12) were referred to the inverse relationship between that two pigments Pyocyanin and Pyoverdin production from P. aeruginosa, while (13) was studied the production of Pyocyanin, and showed that the production of pyocyanin pigment was increased in media of low-iron content. But accordingly to the results of study, the Pyoverdin (fluorescent pigment) was increased in production during incubation times, that suggest the relation between this pigment and bacterial metabolism. (3) referred that the presence of HgCl with culture media of P. aeruginosa reached to increase bacterial resistance.

In the case of CdCl2, the results referred to decrease absorbance value during incubation times, that is very clear result when we know the concentration 0.2M of CdCl2 have an inhibition effect to bacteria by (11 mm as inhibition zone).

An active form of iron – Pyoverdin was studied as a toxic materials more than Iron-free Pyoverdin. These activities, iron binding, and the stimulation of bacterial iron transport indicated that Pyoverdin can function as a resistance agent for P. aeruginosa. The function of iron-Pyoverdin may be related to the pathogenicity of this bacterium because Pyoverdin stimulated growth not only in iron-efficient culture medium but also in defined medium containing transferring and human serum or plasma. efficiency (13).

According to the results, when some heavy metal found in media with these bacteria, the production of Pyoverdin pigment was increased and continue increased during the time by bacterial mechanisms for accumulate of these metals, these mechanisms referenced in introduction by (5,1).

References
2- Utigikar V, Chen Y, Tabak H, Bishop F, Govind R. Combined effects of MgSO4, Zn2O3, on activated of Pseudomonas spp. Water


Table (1): The inhibition zones of heavy metal discs against *P. aeruginosa*

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<tr>
<th>Heavy metal</th>
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<tr>
<td>MgCO₃</td>
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<tr>
<td>C₁₀H₂₀O₂</td>
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<td>EDTA</td>
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<td>NiSO₄</td>
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<tr>
<td>CuCl₂</td>
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</tr>
<tr>
<td>Na₂SO₄</td>
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<tr>
<td>CdCl₂</td>
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Table (2): The absorbance of pigments in broth media of *P. aeruginosa* with heavy metal at three times.

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<td>CdCl₂</td>
<td>0.05</td>
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<td>With out heavy metal</td>
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Figure 1: show the absorbance of pigments in broth media of *P. aeruginosa*
Abstract

One hundred and fifty - three patients with recurrent urinary tract infections (UTI): 97(63.3%) males and 56 (36.6%) females, were studied prospectively at the Urology department and outpatient clinic, Specialized surgical hospital, from February 2000 until February 2003. Their age ranged from (1-40) years.

Evaluation of these patients was done by: proper history, physical examination, laboratory tests and radiological imaging studies (ultrasound (U/S), and/or intravenous urography (IVU) and/or voiding cystourethrography (VCU)).

Congenital urinary tract anomalies were detected in 30 (19.6%) of these patients: 18 (60%) males and 12 (40%) females. The upper urinary tract anomalies (kidney and ureter) were predominating found in 26 (86.6%) patients, while lower urinary tract malformations (bladder and urethra) were found in only 4 (3.3%) cases.

The most common organism isolated was Proteus species in 15 (50%) of the patients with congenital anomalies.

Introduction

Congenital malformations of the urinary tract system comprise diversity of abnormalities. This wide range of anomalies results from multiplicity of factors that interact to influence urinary tract development in sequential and an orderly manner.
from obstruction or reflux. Urinary stasis is the main and most important factor that plays a role during UTI, particularly in congenital urinary tract anomalies(2). Thus, there is a relationship between urinary stasis and infection mostly in reflux or obstructed cases; the final result could be stone formation and/or renal impairment. Therefore, on one side, some of the congenital urinary tract anomalies patients with UTI should be put on prophylactic antibiotics while on the other side, urosurgical management may be recommended for the other patients(2).

**Patients and Methods**

One hundred and fifty-three patients with recurrent urinary tract infections (UTI) 97 (63.3 %) males and 56 (36.6%) females (Fig.2), were studied prospectively at the Urology department and outpatient clinic, Specialized surgical hospital, from February 2000 until February 2003 Their age ranged from (1-40) years

Patients involved in this study, were subjected to: careful medical assessment by history taking, physical examination, and

1- Laboratory tests including the following:
   a- General urine examination (GUE).
   b- Urine for culture and sensitivity (C/S).
   c- Complete blood picture.
   d- Blood biochemistry: (blood urea, serum creatinine, serum electrolytes).

2- Radiological imaging studies including:
   a- Abdominal and pelvic U/S.
   b- IVU.
   c- VCU.

All patients selected for the study were evaluated in view of clinical picture, response to antibiotics, and number of recurrence of UTI in order to determine whether the infection is significant or not. The patients examined comprised many categories: some of them had symptomatic UTI, were treated by a short course of antibiotics with recurrence of symptoms, others had asymptomatic UTI.

Statistical analysis was done by using Chi-square test and p value.

**Results**

I- The general urine examination of most patients showed the following findings:
   - Red blood cells ranged from 4-10 cells/HPF.
   - Pus cells ranged from 4-50 cells/HPF.
   - Albumin from (+) to (++).
   - Proteus species were the main pathogen identified on C/S.
   - However, all patients with congenital urinary tract anomalies were found to be resistant to all antibiotics tested.

II- Significant infection, on basis of clinical picture, response to antibiotics and number of recurrent UTIs; were detected in 25(83%) of patients with congenital urinary tract anomalies; while only 10(9%) of patients without congenital urinary tract anomalies had significant infection (Table 1).

III- Our results were studied and classified as follows:

A. **Anatomical site of congenital urinary tract anomalies Fig.(1):**

1- Upper urinary tract anomalies (kidneys and ureters):
   n = 26 patients (86.6%)
   a- Ectopic kidney
   b- Incomplete duplicate ureters
   c- Renal agenesis
   d- Mal-rotated kidney
   e- Horse-shoe kidney
f- Pelvi-ureteric junction obstruction (unilateral)

g- Adult polycystic kidney

h- Vesico-ureteric reflux 2

i- Ureterocoele

j- Supranumerary kidney

2- Lower urinary tract anomalies (bladder and urethra):

   n = 4 patients (13.3%)

   a- Posterior urethral valve

   b- Bladder neck hypertrophy

B. Congenital urinary tract anomalies according to age distribution Table (2).

C. Types of pathogens that caused the infection. Table (3).

Discussion

The congenital urinary tract anomalies may contribute to end-stage renal disease. A significant proportion will have persistent abnormal anatomical and physiological characteristics of the urinary tract, requiring more attention, more evaluation and may lead to reconstructive surgery to preserve renal function (3).

The complicating UTI in these patients are due to urinary stasis which happens by 2 processes: either obstruction or reflux (4) and these may lead to pyelonephritis or stone formation.

Diamond et al., in a retrospective study done on 270 consecutive pediatric stone former patients over 27 years period, concluded that one-third of them had anatomical lesions (Kidney-ureteric junction obstruction, megaureter, and ureterocele); contributing to recurrent UTI. He also showed that Proteus mirabilis accounted for 82% of pure urine cultures(4).

Newbould et al, on the other hand, carried out a retrospective study on 89 infants dying with features of oligohydramnios sequence with particular reference to anomalies of renal tract, by autopsy examination between 1976 and 1990 in Royal Manchester Children’s Hospital. His study had shown that 41(46%) of these infants had congenital urinary tract anomalies resulting in oligohydramnios sequence(5).

In a prospective study, Huang et al; confirmed the importance of using U/S, IVU and VCU in children with UTI to detect the associated congenital urinary tract anomalies. They found that 67(46.85%) of the 143 children studied had genito-urinary anomalies (6).

The population at risk for UTI includes: newborn particularly premature, prepuberty girls, young boys, and elderly males and elderly females. The presence of leukocytes in urine is of increasing diagnostic importance in complicated UTI. Although the importance of C/S tests can not be underestimated because a concentration as low as 100 colony forming units/mL can cause acute UTI in healthy women (7).

However, most complicated UTI in older men or women occur with obstruction, instrumentation, surgery, anatomic abnormalities, or stones. The majority of patients with uncomplicated infections should receive treatment for 3-5 days. Response to the therapy and long-term cure rates in complicated UTI are related both to the type of underlying abnormality and to the species of the infecting organism(7).

In our study, we focused our attention on those patients with symptoms of UTI that means: dysuria, frequency, urgency and possibly fever who require treatment specially in patients with recurrent UTI on clinical objective basis. The congenital anomalies in those patients were detected by use of radiological studies, i.e. U/S, IVU and VCU. Most of these anomalies were found in the upper urinary tract involving kidneys and ureters that
subsequently had its impact on renal function.

Most of age groups affected were either young (1-10 years) or the older ones (30-40 years). Proteus was the most common pathogen involved in UTI associated with congenital urinary tract anomalies.

In United Kingdom, the predominance of UTI secondary to Proteus mirabilis is a leading cause of pediatric urolithiasis. The significant recurrence rate suggests the importance of prophylactic antibiotics, surgical correction of congenital anomalies, and long-term follow-up of these patient’s population are mandatory(4).

Children without underlying malformations causing the UTI had E. coil as their main pathogen, while those who had congenital urinary tract anomalies gave less growths of E. coli on culture of urine than other pathogens(8).

**Conclusion**

1- Early identification of congenital urinary tract anomalies among patients with UTI is of extreme importance in order to preserve the renal function as much as possible and to prevent further progressive renal damage.

2- We found a markedly higher incidence of congenital urinary tract anomalies in younger children group that indicates a higher morbidity and mortality.

3- Since over 86% of abnormalities were in upper urinary tract, this may implicate a greater insult on parenchymal tissue. End-stage renal disease develops when the infection was in the upper urinary tract system because of the higher morbidity(9).

**Recommendations**

1- All patients with recurrent UTI mostly from first or second visit or first UTIs should be studied carefully and seriously by the radiological tests particularly children, and mostly by the ultrasonography to screen congenital anomalies of urinary tract system(10). The use of ultrasound is so important primarily prenatally as a diagnostic purpose for urinary system malformations and for intrauterine growth retardation, oligohydramnios or polyhydramnios mothers(11) Ultrasonography has sensitivity of 77.4% and specificity of 92% for diagnostic study(12).

2- The use of antimicrobial therapy on sound basis by giving antibiotics only according to the results of culture and sensitivity. It is better to avoid a short course of treatment in these patients with urinary tract infections, in order to prevent bacterial resistance and to minimize recurrence rate of UTI(13).

3- Any UTI in children specially in association with congenital urinary tract anomalies must be extensively investigated and aggressively treated. Although, early surgical intervention in children may be recommended as much as possible to preserve the renal function (14).

4- The radiological tests should be, by all means, made available in the urological center to help in the diagnosis of congenital urinary tract anomalies among UTI patients. The evaluation of anomalies of urinary tract requires high quality ultrasonography, intravenous urography and occasionally voiding cystourethrography(15). Some centers used DMSA radioisotope scan, as a supplementary test, to evaluate the vesicoureteric reflux associated with congenital anomalies(16).

**References**

12. Li-Volti S. Imaging of urinary tract malformations: intravenous urography and/or kidney ultrasonography?. Child Nephrol Urol. 1991;11(2) 96-9
Congenital Urinary Tract Anomalies

Percentage of Anatomical Site

Figure (1) Anatomical site percentage of congenital urinary tract anomalies

Numbers of patients

Figure (2) Number of male and female patients in relation to their age
Table (1) Association or relationship between recurrent UTI and congenital urinary tract anomalies

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<td>25</td>
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</tr>
<tr>
<td></td>
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</tbody>
</table>

Chi – Square test: P < 0.01

Table (2) Congenital urinary tract anomalies according to age distribution

<table>
<thead>
<tr>
<th>Age of patients</th>
<th>No. of cases</th>
<th>Upper UT anomalies</th>
<th>Lower UT anomalies</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 – 10 years</td>
<td>10</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>11 – 20 years</td>
<td>7</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td>21 – 30 years</td>
<td>6</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>31 – 40 years</td>
<td>7</td>
<td>7</td>
<td>0</td>
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</tbody>
</table>

Table (3) Types of pathogens that caused the infection

<table>
<thead>
<tr>
<th>Type of Organism</th>
<th>Up to 10</th>
<th>Up to 20</th>
<th>Up to 30</th>
<th>Up to 40</th>
</tr>
</thead>
<tbody>
<tr>
<td>o Proteus</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Upper UT</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Lower UT</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>o E. Coli</td>
<td>3</td>
<td>3</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Upper UT</td>
<td>2</td>
<td>3</td>
<td>0</td>
<td>1</td>
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<tr>
<td>Lower UT</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>o Pseudomonas</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Upper UT</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>1</td>
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<tr>
<td>Lower UT</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>o Klebsiella</td>
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<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Upper UT</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Lower UT</td>
<td>0</td>
<td>0</td>
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</table>

* No growth of bacteria was 1.
Abstract

A cohort study was done from April / 2004 to December / 2005 at Babylon Hospital for Maternity and Children, and included 200 pregnant women with Toxoplasmosis infection were treated for 4-6 weeks and the outcome of pregnancy was compared before and after treatment.

The analysis showed that the number of abortions was decreased after treatment, and also the rate of congenital abnormalities was decreased after treatment.

Introduction:

Toxoplasmosis is caused by infection with the protozoan parasite called Toxoplasma gondii. Acute infection in pregnant women can be transmitted to a fetus and can cause severe illness (e.g. mental retardation, blindness and epilepsy).

Infection occurs via ingestion of contaminated under-cooked food (especially meat) or transplacentally during acute infection in pregnancy, leading to congenital toxoplasmosis.
Infection can also occur by ingesting the oocysts in cat feces (1). Contamination may also occur by transplanted organs (2). Worldwide about 0.5% to 1% of pregnant women become contaminated by Toxoplasma gondii (3).

In immunocompromised hosts, infection is usually asymptomatic. Symptoms, when they do occur, are mild and non-specific (e.g. lymphadenopathy, fatigue, fever, malaise and myalgia) (4). Congenital infection, however, is a very serious condition with a lethal prognosis in about 10% of cases and a high proportion of disabling sequelae.

Toxoplasmosis is a life long condition but the fetus is only at risk of congenital disease when acute infection occurs in pregnancy.

When the mother is chronically infected by Toxoplasma gondii, the parasite is dormant in the maternal tissues and there is no parasitaemic phase (5).

Infection in early pregnancy can lead to miscarriage or intra-uterine death. Although the classic triad of congenital toxoplasmosis includes chorioretinitis, intracranial calcifications, and hydrocephalus, most infected infants are asymptomatic at birth. It is important to remember that, although asymptomatic at birth, most untreated infants will go on to develop some manifestations of the disease, in particular, up to 85% will develop chorioretinitis (blindness, impaired vision); up to 75% will have some form of developmental delay; and 10% to 30% will have moderate hearing loss.

Seizures and nerve palsies are also common but may be delayed, sometimes for years. Chorioretinitis may not occur before adolescence, so appropriate follow up is very important (6, 7). The presence of a high Toxoplasma specific IgM antibody titer combined with a high IgG titer probably indicates an acute infection within the previous 3 months.

Once acute maternal infection is diagnosed, prenatal diagnosis of foetal infection is necessary. Prenatal diagnosis is based on the detection of the parasite or its constituents by techniques of molecular biology. Foetal blood sampling has now been abandoned at the expense of amniocentesis with polymerase chain reaction (PCR) and mouse inoculation of amniotic fluid (8).

PCR is performed from 18 weeks gestation onwards and at least two months after the sero conversion. Mouse inoculation from the sample is still performed as a control and to study the different serotypes of the parasite (9). Foetal ultrasound is also essential to the management of gestational infection and its role is both diagnostic and prognostic. Cerebral ventricular dilatation
is the most common sign and it is a poor prognostic sign. U/S also used to look for slowed growth, calcium deposits in the brain, a very small brain, and swelling of the abdomen.

Prenatal treatment consists of a combination of pyrimethamine 50 mg/kg/day and sulfadiazine 3 g/day with folinic acid supplementation (50 mg twice weekly). This regimen is given for four weeks alternating with two weeks of spiramycin throughout the pregnancy (10).

When the PCR is negative, it is important for the mother to continue taking spiramycin because of the risk of late transmission to the foetus. Spiramycin is prescribed generally in the first trimester. Because of concerns about teratogenicity, the combination of pyrimethamine and sulfadiazine is usually prescribed in the second and third trimesters. Sulfadoxine may be an alternative to sulfadiazine, although more research is necessary on that matter (11).

We can take simple steps to prevent the infection and problems for the baby. While pregnant, take precautions when cleaning litter boxes, working outdoors and handling food (20). If the fetus is infected early in pregnancy and is diagnosed with brain damage, terminating the pregnancy is considered a reasonable medical option (21).

The aim of the study to summarise the evidence that treating toxoplasmosis in pregnancy improves the pregnancy outcome.

**Subjects and Methods**

We included studies of 200 pregnant women with toxoplasma infection, defined by an increase in specific IgG titres from paired sera or by a high titre of specific IgG at the first antenatal test.

Women could have been tested when they attend Babylon Hospital for Maternity and Children or through incidental testing carried out by their specialist doctor at a privid clinic when suspecting toxoplasmosis infection. The study extended from the period of April /2004 to December /2005.

All the pregnant women with proven toxoplasma infection included in our study were treated with the following drug regimens:

1. Spiramycin alone or
2. Spiramycin + sulphamethoxazole.

The treatment continues for 4-6 weeks. And we follow the whole course of pregnancy, and the outcome of our patients regarding abortion, stillbirth, any congenital abnormality were compared before and after treatment

**Statistical analysis**
Significance was assessed by Chi-square test. A difference between values was considered significant* when \( P < 0.05 \), and very significant** when \( P < 0.01 \).

**Results**

Table (1): shows the number of abortion before treatment was 152 (96: was first trimester abortion; 56: was second trimester abortion). The number of abortions was decreased after treatment (with spiramycin alone or with spiramycin and sulphamethoxazole for 4-6 weeks) to 18 (6: was first trimester abortion; 12: was second trimester abortion) which is statistically significant \( P < 0.001 \).

Table (2): shows the number of congenital abnormality before treatment was 22, and decreased after treatment to 4 (which is statistically significant \( P < 0.001 \)).

Table (3): shows that of 200 pregnant women with Toxoplasmosis; 56 patients receive spiramycin alone for 6 weeks; and 144 patients receive spiramycin and sulphamethoxazole for 4 weeks.

**Discussion**

Toxoplasmosis for the first time has about a 40% chance of passing the infection to her fetus. However, the risk and severity of the baby's infection depend upon when in the pregnancy it occurs. Studies suggest that, when mothers are infected in the first trimester, about 15% of fetuses become infected, as compared to a about 30% in the second trimester and about 60% in the third trimester. However, the consequences of the fetal infection are more severe the earlier in pregnancy the infection occurs.

Infected babies should be treated with two medications, pyrimethamine and sulfadiazine, these drugs should be continued throughout the first year of life, and in some cases, even longer.

A study by the U.S. National Collaborative Treatment Trial found that about 75% of infected babies (including those with severe infections present at birth) who received this treatment have normal intelligence and none has developed hearing loss. The earlier the infection occurs in pregnancy, the worse the outcome is for the fetus, both in term of survival and sequelae.

A recent study shows that among 60 fetuses infected between 17 and 23 weeks gestation, the infection was subclinical in 37 (61.7%) and 21 (35%) had severe intracranial calcifications, while among 56 fetuses infected between 24 and 36 weeks the infection was subclinical in 40 (71.4%) and only 12
(21%) had severe intracranial calcifications (13).

Spiramycin (Rovamycine), a macrolide antibiotic, might concentrate in the placenta and therefore might prevent transmission to a fetus (14). One study estimated that spiramycin decreases transmission of toxoplasmosis by about 60% (15). When mothers are infected during the 6 months immediately before pregnancy, congenital transmission is rare (16).

A French study comparing 52 pregnant women treated with pyrimethamine or sulfadiazine alternating with spiramycin, 72 untreated matched controls suggested that treated mothers had infants with less severe disease at birth (17).

In addition, accumulating evidence suggests that earlier identification and prolonged treatment (1 year) of infants with congenital toxoplasmosis decreases the severity of acute and long-term morbidity, such as impairment of vision and hearing and neuro developmental delay (18,19).

Investigations continue to seek better ways to diagnose and treat toxoplasmosis during pregnancy, in order to prevent fetal infections. For example, one March of Dimes grantee is studying the role of a Toxoplasma protein in enabling the parasite to invade fetal cells. His goal is to develop drug treatment to prevent fetal infections. The possibility of Toxoplasma vaccine is also promising, although it is still at its embryonic stages.

**Conclusion**

Toxoplasmosis remains a serious disease although recent advances in diagnosis and treatment have greatly ameliorated the prognosis for the affected infants.

Routine screening is currently being discussed in several European countries because of the well proven efficiency of the treatment.

When infection in utero is documented, using PCR (polymerase chain reaction) on an amniotic fluid sample, the mother should be started on a combination of pyrimethamine and sulfadiazine with folinic acid supplementation or use a spiramycin.

Infected infants should be treated postnatally up to one year of age with the same drugs, whether the infection is overt or latent and follow-up is important up to adolescence.

**References**

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20- The American college of Obstetricians and Gynecologists. Medical Library Search.2003

Figure (1): Comparison shows number of abortion before and after treatment of toxoplasmosis

Figure (2): Shows number of congenital abnormality before and after treatment of toxoplasmosis
Figure (3):-Shows type and duration of treatment of toxoplasmosis

Table (1): Comparison shows number of abortion before and after treatment of toxoplasmosis.

<table>
<thead>
<tr>
<th>Number of patient</th>
<th>Abortion before treatment</th>
<th>Abortion after treatment</th>
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<tbody>
<tr>
<td>200</td>
<td>152</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>First trimester</td>
<td>Second trimester</td>
</tr>
<tr>
<td></td>
<td>96</td>
<td>56</td>
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Table (2): Shows number of congenital abnormality before and after treatment of toxoplasmosis

<table>
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<th>Number of patient</th>
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<th>congenital abnormality after treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>200</td>
<td>22</td>
<td>4</td>
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</tbody>
</table>

Table (3): Shows type and duration of treatment of toxoplasmosis

<table>
<thead>
<tr>
<th>Type of treatment</th>
<th>No. of patient</th>
<th>duration of treatment (weeks)</th>
</tr>
</thead>
<tbody>
<tr>
<td>spiramycin alone</td>
<td>56</td>
<td>6</td>
</tr>
<tr>
<td>spiramycin + sulphamethoxazole</td>
<td>144</td>
<td>4</td>
</tr>
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</table>
Abstract
In this study, 80 high vaginal swabs obtained from women with vaginitis who admitted to Babylon Hospital for Maternity and Children in Hilla Province were included.

It was found that four isolates of Proteus were isolated from women with IUCD, but there was no isolate detected from non IUCD women.

Proteus isolates were subjected for antibiotic susceptibility test. It was seen that all isolates were sensitive to azithromycin and in lesser degree to calithromycin, ceftazidime and amikacin. Also isolates showed resistance to gentamycin.

Introduction
Intrauterine contraceptive device (IUCD) is a form of contraception in which a small, plastic object shaped like 'T' that is placed in a woman's uterus to prevent pregnancy. However, this device do not protect against sexual transmitted disease such as HIV infection and in rare cases they can produce health risks (2).
The side effect associated with IUCD includes; heavier menstrual periods with more cramps (copper IUCD), lower abdominal pain (cramp) or back pain, Irregular periods or cessation of periods (hormonal IUCD), acne or other types of skin disorders, breast tenderness (with hormone IUCD), headache, mood changes and nausea (3).

Many bacteria is associated with urogenital tract infection especially women with IUCD such as Klebsiella, E.coli, Acinetobacter, Pseudomonas, Bacillus, Streptococcus, Enterobacter…etc. but the role of IUCD and Proteus are unclear, so this study make a trail to isolate Proteus from patient women suffering from vaginitis in the presence of IUCD.

**Patients and Methods**

High vaginal swabs are obtained from 80 women patient with variable degrees of abnormal vaginal discharge. They were examined by wet preparation, gram stained smear and bacteriological culture method. All women were attending in obstetrics and gynecology clinic at Babylon Hospital for Maternity and Children in Hilla City.

The vaginal swabs were inoculated on MacConkey agar and incubated at 37°C for 24hr. Traditional biochemical tests were used for final identification of bacterial isolates (4).

Some antibiotic discs were used to show the effect of them on isolated bacteria using disk diffusion method (4).

**Results and Discussion**

In this study, 80 high vaginal swab obtained from women patients suffering vaginitis were taken. It was found that out of the total 80 samples, only 37 samples showed positive culture and no growth was seen in other samples (43 samples) (table 1). The later may be attributed to microorganisms other than bacteria such as viral, Chlamydia and fungal infection.

Colonization in the female genital tract is stimulated greatly by the presence of a foreign body such as intrauterine contraceptive device. Colonization may be asymptomatic or minimally symptomatic, presenting only as shedding of actinomycotic granules into vaginal fluid. The clinical presentation includes foul-smelling vaginal discharge, intermittent pelvic pain, abnormal bleeding and one or more pelvic masses. Single or multiple abscesses may form in the uterine wall, usually surrounding an embedded IUCD (5).

In table (2), the result was correlated with the results obtained by (6) who have pointed that only multiload culture yielded Acinetobacter, Proteus, Pseudomonas, Lactobacillus, Enterobacter, Klebsiella, Bacillus, Staphylococcus and Moraxella.
However the picture is not clear in case of *Proteus* in women with use IUCD due to small numbers of infected women involved in this study and this bacteria is mainly isolated from urinary tract infection.

It has reported that 13 isolation of *Proteus* are isolated from 283 cases of vaginitis (7). Besides, *Proteus* has been isolated by a rate 4.9% from 100 cases of vaginitis (6).

The isolation rates of different bacteria spp. varied with the duration of the device in utero. The presence of a copper IUCD altered the bacterial flora of the female genital tract (8).

The creation of an acidic environment by some bacteria such as *Lactobacillus*, may promote the growth of some pathogen, while inhibiting the growth of others. Furthermore, the insertion of an IUCD breaches the protective barrier of the cervical mucus, and the IUCD tail creates transmission link into uterus (9).

The highest infection was detected among women in the 15-24 age groups, which represent the most active sexual age. The incidence of pathogenic agents decreased with age (10).

The effect of antibiotics on *Proteus* isolates is also studied. As seen in table (3) that *Proteus* spp. showed highly resistance to gentamycin. Aminoglycoside antibiotics, particularly r gentamycin have been widely used in the treatment of gram negative bacteria infection in hospitalized patients. Perhaps because of the extensive use of gentamycin, the emergence of strains of bacteria resistance to these antibiotics has occurred in some hospitals (11).

It was also found that *Proteus* spp. resistance to amikacin, clarithromycin and ceftazidime by a rate 25%. Amikacin showed greater activity than gentamycin against *E.coli, Klebsiella, Enterobacter, Citobacter and Proteus* by virtue of their lethal effect of gentamycin-resistant strains (12). Ceftazidime provides an extremely active agent against aerobic and facultative gram negative bacteria (13).

The effect of azithromycin was also studied, it was seen that all *Proteus* isolates were sensitive to it. The newer macrolide clarithromycin and azithromycin have increased activity against several gram negative bacteria (14,15).

References


Table (1): Frequency of positive and negative culture among patients with vaginitis

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<thead>
<tr>
<th>Patients</th>
<th>Positive culture</th>
<th>Negative culture</th>
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<tbody>
<tr>
<td>With IUCD</td>
<td>21</td>
<td>14</td>
</tr>
<tr>
<td>Without IUCD</td>
<td>16</td>
<td>29</td>
</tr>
<tr>
<td>Total</td>
<td>37</td>
<td>43</td>
</tr>
</tbody>
</table>

Table (2): Isolation of bacteria from women patients with or without IUCD suffering from vaginitis

<table>
<thead>
<tr>
<th>Isolates</th>
<th>Women with IUCD</th>
<th>Women without IUCD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acinetobacter</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Klebsiella</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Pseudomonas</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>E.coli</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Proteus</td>
<td>4</td>
<td>-</td>
</tr>
<tr>
<td>Lactobacillus</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>21</td>
<td>16</td>
</tr>
</tbody>
</table>

Table (3): Effect of some antibiotics on Proteus spp. isolates from women with IUCD suffering from vaginitis

<table>
<thead>
<tr>
<th>Antibiotics</th>
<th>Isolate no.1</th>
<th>Isolate no.2</th>
<th>Isolate no.3</th>
<th>Isolate no.4</th>
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<tbody>
<tr>
<td>Azithromycin</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Clarithromycin</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Ceftazidime</td>
<td>-</td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Gentamycine</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Amikacin</td>
<td>+</td>
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</tbody>
</table>

(-): sensitive  
(+): resistance
Abstract

The capacity of capsular polysaccharides enable bacteria to resist phagocyte process and help it to dissemination in liver & spleen organs was tested in vivo by measurement of log number of bacteria isolated from these organs in addition to show organ section. Two mice groups was used the first one injected with encapsulated strain, the other one injected with capsule-removed strain.

The results of this study confirmed the important role of capsule in improvement of the dissemination of encapsulated S. aureus bacteria into some organ of mice which observed by increase in log number of bacteria isolated from liver & spleen through an increase in the time of mice injection and reach maximum at 72h to (4.89) (5.32) respectively, but mice groups injected with capsule removed strain reach to (3.16) in liver and (3.78) in spleen at 24h , then decrease of low level in other injection time.

Liver section of mice injected with the same encapsulated S. aureus show congestion , hemorrhage combined by PMN cell infiltration in addition to fusion of white pulp in spleen. These pathological changes occur too , but less severe in mice injected with capsule–removed strain.

INTRODUCTION

S. aureus produces a myriad of virulence factors that contribute to its ability to cause disease, allowing the organism to gain entry into tissues, evade the host immune system, attach to host cells (11). Some S. aureus bacteria form a protective structure called capsule that surrounds the cell wall and is especially important in protecting bacteria cells against phagocytosis by eukaryotic cell, these layers contribute to the ability of bacteria to attach or adhere to particular host cell or...
tissue, this an important factor that determines the virulence of particular pathogens (4).

Having a capsule can be a major factor in determining the pathogenicity of S.aureus bacteria, because the non capsulated S.aureus strain are subject to phagocytosis by blood cells involved the immune response of the infect host organisms, on the other hand phagocytizing blood cells are unable or less able to adhere to, engulf, and digest those bacteria that have capsules (12).

Capsular polysaccharides have been shown to be produced from more than 90% of S.aureus isolates, the production of capsule in strain of S.aureus has been correlated with its virulence properties in both in vitro phagocytic assay and in vivo mouse lethality assay (14). The capsule increases virulence of S.aureus bacteria in laboratory animals through the rabid dissemination of bacteria into several mice organs (21) and the capsule prevents the interaction of the opsonins with its receptors on bacterial surface, that cause protected bacterial cells from phagocytosis (2).

Several studies examined the ability of capsulated and un capsulated S.aureus bacteria to spread through the host body and proliferation in mice liver and spleen by measurement of colony forming unit (CFU)of cell isolation from these organ and found the high CFU of capsular S.aureus bacteria isolated from mice organs compared to the CFU isolated from mice infected with S.aureus bacteria after removal there capsule by different methods (19, 10). found the removal of capsular polysaccharides from S.aureus bacteria reduce the persistence of S.aureus in its hosts, based on microscopic examination of organ section take from mice infected that showed difference in the organ lesions caused by the capsulated and un capsulated S.aureus cell. (16)

The aim of this study was to investigation the important role of capsular polysaccharide in dissemination the S.aureus to many organ in the host body and to inhibit the phagocytic engulfment for bacterial cell.

**Material and Methods**

1- **Bacterial strain and growth conditions**

The S.aureus strain used in this study was isolated from the wound swab of patients admitted to the Mussaib hospital, the diagnosis of this bacteria was acarried out according to the (6) and investigate for the presence of the capsule by using negative stain and slide clumping factors methods according to (3).

The bacteria were grown in (100ml) of brain heart infusion broth (BHI) at 37°C with genetal shaking for 18h, then culture was centrifuged at (2000 rpm) and the pellet was resuspended in 10ml of medium to give a cell density of (10⁴ cell/ml) (4).

2- **preparation capsule-removal strain suspension.**

The removal of capsular polysaccharide from bacterial cell was done by used rabid agitation, as shown in (9,8).

3- **Quantitative organ culture.**

Tow group of Balb female mice (20 mice in each one), 8 to 12 week old were used. the first group were injected intraprotinally with (10⁴ cell/ml) of capsular strain S.aureus while the other injected with 10⁴ cell/ml of capsule – removal strain S.aureus suspension.

At each time period (18-24-48-72h) following bacteria inoculation five mice from each group were sacrificed, the liver & spleen were removed &portions from these organs were homogenized separately in phosphate buffer stain containing 0.05 % Triton × 100, with a tissue grinder. after homogenization aliquots of these organ suspension were serially diluted in PBS.
plated on trypticase soy agar contain 5% sheep blood. colonies were counted after 24h of incubation at 37°C and bacteria per gram were enumerated (7).

4- Preparation of Histological sections

Over a period at 3 days the liver & spleen mice were fixed in 10% Para formaldehyde and processed by routine methods to provide paraffin wax section which were stained with hematoxylin &eosin stain to detect bacteria & other pathological change(1)

Results & Discussion

The study achieved to investigate the role of the capsular polysaccharide in pathogenicity and disseminated process of *S.aureus* bacteria in liver and spleen of mice by recovered this bacteria from these organs & performed its sections.

The *S.aureus* bacteria survival in these organs was monitored at each time point (18, 24, 48, 72h) by isolation the number of viable bacteria in liver & spleen of mice infected intraperitonally with 10⁴ cell/ml of capsular strain & capsule-remove strain.

As shown in (Fig 1) the log number of capsule-remove strain *S.aureus* recovered from liver of mice increased slightly to reach (3.16) at 24h post inoculated and decreased at low level (1.99) at 72h and reach to (2.34) at 18h & 48h whereas capsular *S.aureus* bacteria , increase with increase time injection (from 18-72h) to reach maximum at 72h (4.89).

The (Fig 2) show the slightly increased of log number of capsular *S.aureus* recovered from spleen mice which reach to (5.13) at 48h & (5.32) at 72h , but the capsule–remove *S.aureus* bacteria isolated in high log number (3.78) at 24h and then decrease clearly at 48h (2.82) & 72h (2.53).

Several studies reported that capsule play an important role in staphylococci infection and dissemination within the host organs by inhibit phagocytic engulfment (11).

Many workers provided evidence that peptidoglycan is the key cell wall component promoting opsonization of *S.aureus* when removal capsule by many automatic procedure such as agitation and washing(5).

The infected tissue with *S.aureus* exhibited large amount of leukocytic cells particularly PMN , which lead to lysis of microorganism by phagocytosis process and the capsule has been described as virulence factors with the capacity to interference with the innate host defense system by preventing Nutfrophil cell to phagocytic bacterial cell (10).

Histological examination was performed on liver & spleen sections taken from mice at 72h post inoculation with capsular and capsule – remove *S.aureus* bacteria. The histopathological study of liver revealed some pathological changes as a result of infected with capsular *S.aureus* showing multiple foci of inflammation with high average of PMN migration , combined with congestion , hemorrhage and necrosis (Fig 3).

In the other hand the examination of spleen show severe hemorrhage , congestion in red pulp with marked necrosis, oedema combined with hyperplasia of white pulp and increase number of megakaryotic cell (Fig 4).

It has been shown only minimal to mild lesions in liver usually represented by high infiltration of inflammations cell to this organ, that combined by widest of white pulp (Fig 5) , and increased in number megakaryocytic in spleen of mice infected with un capsulated *S.aureus* (Fig 6) (×100) , by 20h following incubation , most (80 to 90 %) of the capsular *S.aureus* inoculated were trapped in liver and spleen with majority in liver & clear difference was observed between capsulated and un capsulated *S.aureus* strain(17). 8% of mice injected with capsular *S.aureus* bacteria died within 8 days after injection , while only 44% mice injected with un capsulated strain died within the same period , this results show that removal capsule attenuates virulence of bacteria (13,15).

Several studies show high accumulation of neutrophils in the liver after injection with capsular &un capsular *S.aureus* bacteria , that responsible in elimination of bacteria from this organ and these data support the conclusion that capsule blocks the removal of M.O from liver therefore the number of bacteria increase and combined with sever pathological effects (20).

Infected tissue with *S.aureus* exhibited PMN in liver and spleen , this may be discus that reason for the presence of large infiltration foci in these organs section (18).
References

20. Xie C, Alcaide P, Geisbrecht V, Herrmann M, Preissner T, Luscinskas F, Chavakis T. Suppression of experimental autoimmune encephalomyelitis by extra cellular adherence protein of


Fig(1) Numbers of capsulated and capsule-removal S. aureus bacteria isolated from mice liver following intraperitonally injection.

Fig(2) Numbers of capsulated and capsule-removal S. aureus bacteria isolated from mice spleen following intraperitonally injection.
Fig(3): Liver section taken from mice were inculcated intraperitonally with capsular S.aureus bacteria with multiply inflammation foci (IF), Congestion (CO), necrosis (N) (×100).

Fig(4): Spleen section taken from mice inculcated intraperitonally with capsulated S.aureus bacteria showed hemorrhage(H), Odema(O) and hyperplasia(HP)(×100).
Fig (5) : liver section taken from mice were inculcated intraperitonally with Capsule – remove S.aureus bacteria showed high infiltration PMN(IP) (400X).

Fig (6) : Spleen section taken from mice inculcated intraperitonally with capsule – remove S.aureus bacteria showed increase number of megakaryocytic(M) & infiltration PMN(IP) (400X).
Abstract
To evaluate the prevalence of ANCA antibodies in patients with systemic vasculitis and to compare that to its prevalence in patients with different rheumatic diseases and in normal healthy control subjects.

Fifty patients with systemic vasculitis and fifty patients with different rheumatic diseases and one hundred healthy control persons have been tested for the presence of ANCA antibodies “Anti PR3” and “Anti MPO” by ELISA technique in central public health laboratory in Baghdad-Iraq.

Seventeen patients out of fifty patients 34% with systemic vasculitis were found to be positive for ANCA antibodies, nine patients were positive for c.ANCA “Anti-PR3”, eight patients were positive for p.ANCA “Anti-MPO” and two patients were positive for both types with specificity of 99% and sensitivity of 34%.

All fifty patients with different rheumatic disease were negative for ANCA antibodies, and also the healthy control persons were negative except one who was positive for c.ANCA “Anti-PR3”.

ANCA antibodies should be looked for in all patients with suspected vasculitis, their absence will not rule it out, the test through not highly sensitive 34% however it is highly specific 99% and should alert the attending physician towards further investigation including histopatho-logical tissue diagnosis.

Ali Alkazzaz
Babylon University/College of Medicine

Anti Neutrophilic Cytoplasmic Antibodies
In Patients with Systemic Vasculitis

M J B
**Introduction**

Vasculitis means inflammation of blood vessels, the blood vessel is primary site of inflammation, the blood vessels wall is thus infiltrated with inflammatory cells and perivascular cuffing does not equate with vasculitis, the consequence of such inflammation is destruction of the vessel wall which is seen on histology as a fibrinoid necrosis. The vasculitis are a heterogenous group of relatively uncommon diseases which can arise de novo e.g. polyarteritis nodosa, Wegener’s granulomatosis or as a secondary feature of an established clinical disease such as Rheumatoid arthritis or systemic lupus erythematosus.

The consequence of such vascular inflammation depend upon size, site, and the number of blood vessels involved, vasculitis can occasionally localized and clinically insignificant but commonly is generalized and potentially life threatening, especially when small muscular arteries are involved.

The classification of vasculitis is confusing because of the considerable overlap between the different vasculitis syndromes and because the cause of the vasculitis is usually unknown.

In 1993 an Chapel Hill consensus conference [CHCC] which developed definition for the nomenclature of systemic vasculitis based on clinical and laboratory features and classification scheme based on vessel size:

1. Large vessel vasculitis
2. Medium-sized vessel vasculitis
3. Small vessel vasculitis

(1)

because of the developments of ANCA antibodies assay some physicians feel that the [CHCC] system was inadequate and they developed modification which reflects not only dominant vessel size but also ANCA antibodies, this had split Wegener’s granulomatosis, Churg–Strauss syndrome and microscopic polyang from rest because:

1. They often involve small arteries.
2. They often associated with ANCA.
3. They associated with high risk of glomerulonephritis.
4. They are diseases which respond best to immunosuppression with cyclophosphamide.

The ANCA antibodies constitute a family of antibodies directed against various components of neutrophil cytoplasm (2). The over all incidence of systemic vasculitis is greater than was previously thought and it is estimated to be around “10 per million per year”, this may represent a real increased incidence with time or increased physician awareness especially with the availability of the ANCA tests (3)(4).

Davies and associates in 1982 were first to report that certain IgG antibodies were directed against intracytoplasmic antigens of the neutrophil cells in patients with glomerulonephritis and systemic vasculitis. Vander wode and associates in 1985 termed these as “Antineutrophil Anti-cytoplasmic antibodies and have recognized their connection with Wegener’s granulomatosis as well as their apparent specificity for the disease, they also suggested that their titer correlated with the disease activity (5)(6).

The classical methods for the determination of ANCA are immunofluorescent methods, with these indirect immunofluorescence techniques two main patterns are recognized, [c.ANCA], [p.ANCA] and other pattern which non specific stain[a.ANCA].

I- c.ANCA: Anti-PR3

Show a diffuse granular staining cytoplasm, with some accentuation near center of cells, and the main target antigen is proteinase - 3 (PR3), and this pattern is chiefly found in Wegener’s granulomatosis and related disorders.

II- p.ANCA : Anti-MPO

Show perinuclear to nuclear staining pattern, the main target antigens are : myeloperoxidase (MPO), granulocyte-
specific elastase, lactoferrin, lysozyme, cathepsin G, B-glucuronidase and defensin the Anti-MPO is found in microscopic polyangiitis and other related disorders.

III- a.ANCA:-

Show non-specific staining (7) (8).

Unlike c.ANCA the p.ANCA is not specific for a single disease, antibodies of p.ANCA positive sera are mainly directed to (MPO), antibodies to other antigens often result in a similar p.ANCA pattern, they seen in wide spectrum of diseases including most of systemic vasculitis and other diseases like inflammatory bowel disease and IDDM. This makes a clear interpretation and classification of IIF patterns difficult, therefore every positive IF-ANCA finding specially p.ANCA should be differentiated by ELISA techniques using purified antigens(9).

**Immune pathogenesis of ANCA:-**

All ANCA associated vasculitis have uncommon, contrary to immune complex vasculitis, that they occur without complement consumption(10).

1-Neutrophil granuloprotiens (PR3, MPO) will be released into circulation and may bind intothelium through charges interactions, leading to further proteolytic damage.

2-In the case of PR3 the enzyme may also be carried as immuno-complex with c.ANCA (11).

The other apparent co-factor in ANCA associated vasculitis is infection leading to activation of neutrophils, therefore it appears that c.ANCA in association with infections is sufficient to induce vasculitic lesions(4) (11).

**AIM OF STUDY**

The aim of this study was to find out the prevalence of ANCA antibodies in patients with systemic vasculitis in order to help in the evaluation of such patients and in their management and also to find the prevalence of these antibodies in different rheumatic diseases and in healthy normal subjects.

**PATIENTS AND METHODS**

One hundred patients have been included in this study, they were divided into two groups:-

**Group I:**

This included fifty patients with a primary or secondary systemic vasculitis, twenty seven female (54%) their ages ranged between 15-65 years with a mean age of 38 years, and twenty three males (46%), their ages ranged between 18-70 years, with a mean age of 40 years, most of the patients were from three major hospitals in Baghdad (Baghdad teaching hospital, alhnrian teaching hospital and AL-Yarmok hospital), the rest were referred to the central public health laboratory from other hospitals or clinics table (2).

**Group II:**

This included fifty patients with different rheumatic diseases without vascular involvement, all of them were from Baghdad teaching hospital, twenty five females (50%) with ages ranged between 14-70 years and a mean age of 40 years, twenty five males (50%), their ages ranged between 12-63 years with a mean age of 42.5 years table (3).

**Group III: control group**

This included one hundred healthy persons, their ages ranged between 15-70 years with a mean age of 42.5 years. All the three group subjects were evaluated for the presence of ANCA antibodies and for the presence of ANA table (4).

The diagnosis was made by the attending physicians using the standard criteria [ACR criteria] before the results of the ANCA test became available.

All patients in group I had a clinical diagnosis of active systemic vasculitis with laboratory markers of active disease
or a clinical suspicion of vasculitis was there in some patients.

Patients of group II were also diagnosed according to the ACR criteria and all the patients had clinically active disease.

Twenty patients of group I were already on some sort of immuno suppressive therapy either steroid or with a cytotoxic therapy but none of them were in a clinical remission state.

A tissue diagnosis for vasculitis was only done for one patient who was diagnosed as having Wegener’s granulomatosis, the histological result supported the diagnosis.

The detection of ANCA antibodies:

The identification of auto antibodies against neutrophils ANCA is primarily based on indirect immuno fluorescence (IIF) and followed up by monospecific enzyme linked immunosorbent assay (ELISA) and immunoblots.

In this study ELISA method have used for the detection of both types of ANCA ”Anti-PR3 and Anti-MPO” and also for ANA.

The ELISA values:

For c.ANCA “Anti-PR3”:

Positive: value above 5 U/ML
[Mean +2SD of normal control]
Negative: value below 5U/ML

For p.ANCA “anti-MPO”:

Positive: value above 8 U/ML
[Mean+2SD of normal control]
Negative: value below 8U/ML

The type of immunoglobin which been tested by ELISA is IgG3 (12)

RESULTS

Patients group I:

This group included fifty patients with a different types of systemic vasculitis with a different systemic involvement out of them seventeen patients were positive for either c or p ANCA antibodies (34%) table (7).

Positive c.ANCA “Anti-PR3” patients:

Nine patients (18%) out of the total patients with systemic vasculitis were positive for c.ANCA.

The patients were distributed equally between age groups of 20-39 years, 40-59 years and above 60 years table (6).

Three of them were positive for ANA (33%) table (7), the respiratory system was mostly involved (66.6%) followed by the locomotor system (55.5%) and renal involvement was found in (33.3%) table (8).

Positive p.ANCA “Anti-MPO” patients:

Eight patients (16%) out of the total patients with systemic vasculitis were positive for p.ANCA, four of them were between age of 20-39 years, (50%) table (6).

Three patients were positive for ANA (37.5%) in the p.ANCA group table (7).

Six patients (75%) had renal involvement either as primary or secondary vasculitis table (8).

From the total number of patients of group I, eighteen patients had renal involvement, six of them were positive for p.ANCA (33.3%).

Two patients were positive for both types (c+p), the first patient was 35 years old male with idiopathic acute renal failure and arthritis of knee joint, the second patient was a 65 years old female with a clinical diagnosis of temporal arteritis and visual impairment but a normal brain scan, both patients were negative for ANA.

As whole seventeen patients were positive for ANCA antibodies, seven patients between age of 20-39 years, six patients between age 40-59 years and rest above 60 years table (6).

Renal system and locomotor system have been involved equally followed by respiratory system table (8).

Six patients were positive for ANA (35.2%) table (7).

Patients group II:

Fifty patients with different rheumatic diseases from different age groups table (3,4) have been tested for both types of ANCA antibodies ”Anti-PR3, Anti-
MPO” and for ANA, none of them was positive for ANCA antibodies, twenty three of them were positive for ANA (46%).

**Control group III:-**

One hundred healthy persons from different age groups, all were tested for both types of ANCA antibodies “Anti-PR3, Anti-MPO” and also for ANA, all were found to be negative for ANCA except one person who had diabetes on oral hypoglycemic agent, his age was 65 years old was positive for c.ANCA antibody.

ANA was positive (2.66%).

The specificity of ANCA antibodies test for detection of systemic vasculitis was 99% but the sensitivity of test was (34%).

The positive predictive value of test was (75%) and the negative predictive value is (94%).

**DISCUSSION**

In some patients, especially those with limited form of the disease, the diagnosis can difficult to substantiate, with ANCA assay may help in early diagnosis of those patients, given the high specificity of ANCA for Wegener’s granulomatosis it may help in making earlier diagnosis, before full range of symptoms, or it may be the decisive diagnostic factor in cases that appear clinically typical but in which a histopath-ological diagnosis cannot be made.

Parlevliet and associates described eleven patients with symptoms that strongly suggested Wegener’s granulomatosis, in only two patients a firm histologic diagnosis was made, ten patients had a positive ANCA test which were considered diagnostic and influenced the treatment decisions(13).

A negative ANCA tests will not rule out a diagnosis of vasculitis, however none of untreated patients with active generalized disease remain negative, in most of them, ANCA test were detected a few weeks after the onset of full range of symptoms consequently if vasculitis is suspected several serial tests determination are recommended.

There was reports about detection of ANCA in other disease e.g type I diabetes mellitus, anti-MPO antibody was detected in the serum patients with type I diabetes mellitus, state of chronic neutrophil activation has been described in diabetes(14).

In this study one healthy subject with type II diabetes mellitus on oral hypoglycemic agent developed weak positive result for Anti-PR3.

In this study the titers of ANCA antibodies were not correlated with disease activity i.e only a positive or a negative value is measured and further studies are needed to correlate the titer with disease activity, this will help to follow the activity of the disease and will help to distinguish relapses from other intercurrent illness mainly infections which remain always a threat to patients on immunosuppressive therapy(12).

To compare this study with similar study by Crista etal, in which one hundred ten patients of presumptive diagnosis of systemic vasculitis and idiopathic crescentic glomeralonephritis with vascular manifestation, they found twenty-five patients (22.7%) were positive to either c or p ANCA, however, no histological diagnosis was available (15) table(9).

In another study by Bartunkova-J etal (1010) sera samples from a different diseases including (systemic vasculitis, autoimmune diseases, isolated glomeralonephritis, inflammatory intestinal diseases, ophthalamic inflammatory diseases and other diseases) have been screened for both anti PR3 and anti MPO” antibodies, they found one hundred and fifteen patients positive for either: twenty-six cases of systemic vasculitis, twelve cases of other auto-immune diseases, nine cases of isola-ted glomeralonephritis, seven cases of inflammatory intestinal diseases, six cases of ophthalamic inflammatory diseases, and six cases of other diseases(16).
In the Bernhard et al study the overall sensitivity of ANCA was 60% and specificity was:
- proven biopsy patients: 160/222 (72%)
- clinical diagnosis patients: 35/55 (63%)
- control subjects: 0/119 (0%) (5).

In this study the cytoplasmic pattern predominated in patients with pulmonary involvement six patients (66.6%) and the perinuclear pattern predominated in patients with renal involvement six patients (75%). (8)

Regarding c.ANCA antibody to compare with another study by Cohen Tervant et al which detected a specificity of (97%) for Wegener’s granulomatosis and a sensitivity of (93%) (18).

Gross et al study detected a specificity (97%) and sensitivity (81%) for proven biopsy disease (8).

In this study four patients with clinical diagnosis of Wegener’s granulomatosis, three of them were positive for c.ANCA antibodies (75%).

Regarding the p.ANCA it was found to be less specific and sensitive than c.ANCA and it is usually positive in patients with microscopic polyangiitis and crescentic glomeronephritis, a study by Flak et al, which found that (27/35) (77%) of patients with idiopathic glomeronephritis ”Microscopic polyangiyis ” were positive for p.ANCA, (5/11) (45%) of lupus nephritis were positive and none in control group (7).

The sensitivity in patients with diffuse systemic vasculitis with renal involvement was (50%) and for Microscopic polyangitis was (80%)(1).

In this study six patients (33.3%) with idiopathic glomeronephritis or patients with renal impairment associating systemic vasculitis were positive for p.ANCA “Anti-MPO”.

Regarding ANA association with ANCA, a study by Saviage et al found that patients who were positive for c.ANCA were (19%) positive for ANA and patients with p.ANCA were (47%) positive for ANA (19).

In this study three patients (33.3%) who were positive for c.ANCA were positive for ANA and three patients (37.5%) were positive for p.ANCA were positive for ANA i.e six patients of total patients with positive ANCA (35.2%) were positive for ANA.

We conclude that ANCA antibodies detection should be looked for in all patients with suspected vasculitis, their presence will confirm a suspected clinical diagnosis, their absence will not rule it out, the test though not highly sensitive 34% however it is highly specific 99% and should alert the attending physician towards further investigation including histopathological tissue diagnosis.

REFERENCES
4-Cona L. Vasculitis, epidemiology, pathology and pathogenesis. Primer on
**Table (1):** Documented clinical indication for ANCA antibodies

<table>
<thead>
<tr>
<th>Clinical Diagnosis</th>
<th>Target Antigen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systemic vasculitis</td>
<td>IF “Immmuno Flurescence”</td>
</tr>
<tr>
<td>Wegener’s granulomatosis</td>
<td>c.ANCA,rare p.ANCA PR3,rare MPO</td>
</tr>
<tr>
<td>Microscopic polyangitis</td>
<td>c.ANCA,p.ANCA PR3,MPO</td>
</tr>
<tr>
<td>Churg-strauss-syndrome</td>
<td>p.ANCA MPO</td>
</tr>
<tr>
<td>Unclassified vasculitis</td>
<td>Rare ANCA Rare PR3,MPO</td>
</tr>
<tr>
<td>Polyarteritis nodosa</td>
<td>Rare ANCA Rare PR3,MPO</td>
</tr>
<tr>
<td>Collagen disease and other Rheumatic disorder</td>
<td></td>
</tr>
<tr>
<td>Rheumatoid arthritis</td>
<td>Gs-ANA, p.ANCA, a typical ANCA Unknown,ANA,rare MPO, lactoferrin</td>
</tr>
<tr>
<td>SLE</td>
<td>p.ANCA MPO,Lactoferrin</td>
</tr>
<tr>
<td>Other diseases</td>
<td></td>
</tr>
<tr>
<td>Ulcerative colitis</td>
<td>p.ANCA Cathepesin-G, Lactoferrin</td>
</tr>
<tr>
<td>Morbus chron</td>
<td>p.ANCA Cathepesin-G, Lactoferrin</td>
</tr>
</tbody>
</table>

**Table (2):** Clinical diagnosis of group (I)

<table>
<thead>
<tr>
<th>Clinical Diagnosis</th>
<th>No. of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Idiopathic G.N or acute renal impairment with possibility of vasculitis</td>
<td>8</td>
</tr>
<tr>
<td>2. SLE vasculitis</td>
<td>7</td>
</tr>
<tr>
<td>3. Idiopathic unclassified vasculitis</td>
<td>7</td>
</tr>
<tr>
<td>4. Rheumatic arthritis vasculitis</td>
<td>6</td>
</tr>
<tr>
<td>5. Wegener’s granulomatosis</td>
<td>4</td>
</tr>
<tr>
<td>6. Hypersensitivity vasculitis</td>
<td>4</td>
</tr>
<tr>
<td>7. Polymygia rheumatica</td>
<td>3</td>
</tr>
<tr>
<td>8. Sjogren syndrome vasculitis</td>
<td>2</td>
</tr>
<tr>
<td>9. Henoch-sholine purpura</td>
<td>2</td>
</tr>
<tr>
<td>10. Good pasture syndrome</td>
<td>1</td>
</tr>
<tr>
<td>11. Temporal arteritis</td>
<td>1</td>
</tr>
<tr>
<td>12. Still disease vasculitis</td>
<td>1</td>
</tr>
<tr>
<td>13. Dermatomyositis with vasculitis</td>
<td>1</td>
</tr>
<tr>
<td>14. Gastrointestinal vasculitis</td>
<td>1</td>
</tr>
<tr>
<td>15. C.N.S vasculitis</td>
<td>1</td>
</tr>
<tr>
<td>16. Bacterial endocarditis vasculitis</td>
<td>1</td>
</tr>
</tbody>
</table>

Total=50 patients
Table 3: Subsets of group (II) patients of different rheumatic diseases.

<table>
<thead>
<tr>
<th>Clinical diagnosis</th>
<th>No. of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  Rheumatoid arthritis</td>
<td>10</td>
</tr>
<tr>
<td>2  SLE</td>
<td>10</td>
</tr>
<tr>
<td>3  Systemic sclerosis</td>
<td>5</td>
</tr>
<tr>
<td>4  JRA</td>
<td>5</td>
</tr>
<tr>
<td>5  Seronegative arthritis</td>
<td>5</td>
</tr>
<tr>
<td>6  Inflammatory myositis</td>
<td>5</td>
</tr>
<tr>
<td>7  Sjogren syndrome</td>
<td>5</td>
</tr>
<tr>
<td>8  Overlap syndrome</td>
<td>5</td>
</tr>
</tbody>
</table>

Total=50 patients
ANA positive in(46%)

Table (4):-Sex and age distribution for different groups

<table>
<thead>
<tr>
<th>group</th>
<th>No. of patients</th>
<th>sex</th>
<th>No.</th>
<th>%</th>
<th>Mean age(years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(GI)patients with vasculitis</td>
<td>50</td>
<td>female</td>
<td>27</td>
<td>54%</td>
<td>38</td>
</tr>
<tr>
<td></td>
<td></td>
<td>male</td>
<td>23</td>
<td>46%</td>
<td>40</td>
</tr>
<tr>
<td>(GII)patients with different rheumatic disease</td>
<td>50</td>
<td>female</td>
<td>25</td>
<td>50%</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td></td>
<td>male</td>
<td>25</td>
<td>50%</td>
<td>42.5</td>
</tr>
<tr>
<td>(GIII)control healthy persons</td>
<td>100</td>
<td>female</td>
<td>50</td>
<td>50%</td>
<td>42.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>male</td>
<td>50</td>
<td>50%</td>
<td></td>
</tr>
</tbody>
</table>

Table (5): Patients and control age groups

<table>
<thead>
<tr>
<th>Age groups</th>
<th>Group I patients</th>
<th>%</th>
<th>Group II patients</th>
<th>%</th>
<th>Group III control</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0-19 years</td>
<td>6</td>
<td>12</td>
<td>8</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>2</td>
<td>20-39 years</td>
<td>18</td>
<td>36</td>
<td>19</td>
<td>38</td>
<td>38</td>
</tr>
<tr>
<td>3</td>
<td>40-59 years</td>
<td>16</td>
<td>32</td>
<td>17</td>
<td>34</td>
<td>34</td>
</tr>
<tr>
<td>4</td>
<td>Above 60 years</td>
<td>10</td>
<td>20</td>
<td>10</td>
<td>20</td>
<td>20</td>
</tr>
</tbody>
</table>
Table (6): age groups for ANCA positive patients

<table>
<thead>
<tr>
<th>Age groups(years)</th>
<th>c.ANCA patients</th>
<th>%</th>
<th>p.ANCA patients</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 0-19 years</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>2 20-39 years</td>
<td>3</td>
<td>33.3</td>
<td>4</td>
<td>50</td>
</tr>
<tr>
<td>3 40-59 years</td>
<td>3</td>
<td>33.3</td>
<td>3</td>
<td>37.5</td>
</tr>
<tr>
<td>4 &gt;60 years</td>
<td>3</td>
<td>33.3</td>
<td>1</td>
<td>12.5</td>
</tr>
<tr>
<td>total</td>
<td>9</td>
<td>52.9</td>
<td>8</td>
<td>47</td>
</tr>
</tbody>
</table>

Table (7): Clinical diagnosis of ANCA positive patients and relation to ANA

<table>
<thead>
<tr>
<th>ANCA No.</th>
<th>Sex</th>
<th>Clinical diagnosis</th>
<th>ANA No.</th>
<th>Sex</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>3</td>
<td>Wegener’s granulomatosis</td>
<td>1</td>
<td>Male</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Unclassified vasculitis</td>
<td>1</td>
<td>female</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>Acute renal failure</td>
<td>1</td>
<td>male</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Temporal arteritis</td>
<td>1</td>
<td>female</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>C.N.S vasculitis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>total</td>
<td>4</td>
<td>55%</td>
<td>3</td>
<td>33%</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>2</td>
<td>Idiopathic vasculitis</td>
<td>1</td>
<td>Female</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>Idiopathic G.N.acute renal failure</td>
<td>1</td>
<td>Male</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Temporal arteritis</td>
<td>1</td>
<td>female</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>SLE vasculitis</td>
<td>1</td>
<td>female</td>
<td></td>
</tr>
<tr>
<td>total</td>
<td>2</td>
<td>64.7%</td>
<td>3</td>
<td>37.5%</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>6</td>
<td>64.7%</td>
<td>6</td>
<td>35.2%</td>
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61
Table (8): Systemic involvement in ANCA positive patients

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<tr>
<th>System</th>
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<td>Skin</td>
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<tr>
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<td>-</td>
<td>-</td>
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<td>C.I.T</td>
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<th>C+p ANCA</th>
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<td>52.9</td>
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<tr>
<td>RENAL</td>
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<td>C.V.S</td>
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<td>5.8</td>
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<tr>
<td>C.I.T</td>
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Table (9): Sensitivity and specificity of ANCA in different studies

<table>
<thead>
<tr>
<th>Specificity</th>
<th>Present study</th>
<th>Bernhard1990</th>
<th>Gross 1993</th>
<th>Crista 1995</th>
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<tbody>
<tr>
<td></td>
<td>99% clinical diagnosis</td>
<td>98% clinical diagnosis</td>
<td>97% clinical + pathological diagnosis</td>
<td>96% clinical diagnosis</td>
</tr>
<tr>
<td>Sensitivity</td>
<td>34% clinical diagnosis</td>
<td>60% clinical and pathological diagnosis</td>
<td>81% clinical and pathological diagnosis</td>
<td>22.7% clinical diagnosis</td>
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Abstract

This study was designed to determine the accuracy of cervical mucus scoring (CMS) for timing of ovulation in natural and stimulated cycle, and to compare the results with real time pelvic ultrasonography (P.U/S) for ovarian follicular growth and maturation, in both cycles. A total of twenty-two cervical mucus (CM) was obtained and scored according to Insler mucus scoring; together with (P.U/S) folliculometry. There was a high positive correlation (r = 0.96, p<0.05) between determination the day of ovulation by serial Insler scoring assessment of (CM) and serial (P.U/S) folliculometry in natural cycle; while there was no such correlation (r = 0.15, p>0.05) in the stimulated cycle.

Introduction

The key to become pregnant or to avoid pregnancy is to determine when ovulation to occur. If a women is ovulating she can relay on physiological clues; these are signs of ovulation; presented by her body to predict ovulation. These signs are cervical mucus (CM), its cyclical nature makes it useful biomarker in managing fertility (1). Another fertility signs; cervical position, ovulation pain (2), ovulation predictor kits, saliva ovulation kits (3), and others; monitoring these changes has been long used as markers of fertile interval (4,5,6,7). Assessment of (CM) would be particularly useful for couples who want to time their intercourse either to avoid or to facilitate conception (8). Cervical secretion are associated with higher fecundability with in the fertile window (9). This study show the significance of using Insler scoring assessment of (CM) in natural and stimulated cycles, and compare the results with serial (P.U/S) folliculometry, for determining the day of ovulation when ultrasonography is not available.

Materials and method:

Twenty-two couples with primary unexplained infertility were studied during their attendance in Embryo Research And Infertility Treatment Centre at Baghdad University. The females partner were with mean infertility duration of five years and with mean age of thirty years. They have normal ovulatory cycle, clean vagina and cervix. Eleven females were studied with spontaneous cycle (natural), while the other eleven under went ovarian stimulation program by clomid (Clomiphene Citrate,"C.C. Merell company,England) 50 mg. tablet, twice daily from cycle day two through out Cycle day six.
These two groups were followed from cycle day-10 for the degree of opening of the external cervical os, the cervical fluid was aspirated by clean sterile pipette. The aspirate was studied for quantity, spinnbarkeiting, and a drop was layed on microscope slide for ferning pattern. These observations were graded according to Insler mucus scoring; table(1),(10). These grades were added together to have the final score for each woman. At the same time these females were subjected to daily real time (P.U/S) for ovarian folliculometry from cycle day-1

RESULTS:
Cervical mucus score were evaluated according to Insler mucus scoring in natural and stimulated cycle, for 22 female partners of unexplained infertility couples. Follicular growth was followed by serial (P.U/S) measurement till follicular rupture. Figure (1), shows that there is unadverse effect of "C.C" on CMS; {median CMS =12 in natural cycle (95% confidence interval(CI) =6.84,11) and in "C.C" cycle =8(95%CI=7,12);p<0.05}. Figure (2); demonstrate that there was no such effect on follicular diameter ,{mean follicular diameter =1.98 in natural cycle(95% CI=1.84,2.11) and in "C.C" cycle= 1.82(95% CI=0.84,2.79);p>0.05}. There was strong correlation between (CMS) assessment and follicular diameter measurement in the natural cycle group (r =0.96,p<0.05); while there was no such correlation (r =0.15,p>0.05) in "C.C" cycle group.

DISCUSSION:
Cervical mucus is a normally healthy discharge which is controlled by estrogen. Non-estrogenic mucus is viscous and tend to block the passage of human spermatozoa to the uterus (11). Ultrasound is the routine method for assessing ovarian follicular growth , maturation and determine the day of ovulation (4). In the present study we scored the (CM) according to Insler mucus scoring . A high score means that a woman is close to ovulation, and the mucus tend to show distinct crystal-fern-like appearance under the microscope; it can be also stretched into thread (11). The adverse effect of "CC" on CM was obvious in our study demonstrated by the significant difference (p<0.05) between the 95% CI of the natural and stimulated cycle, figure (1). Clomid is a synthetic hormone which has an anti-estrogenic activity(12), tricking the brain in to producing higher level of follicular stimulating hormone, than untreated cycle, which in turn stimulate ovarian follicular growth and maturation , but one of its side effect is thickening of CM and vaginal dryness(13,14), impairing conception and implantation(15). This adverse effect is well demonstrated in our study as well as by Randall and Templeton (12),who studied sperm-mucus interaction in vitro in natural and stimulated cycle. This negative effect on (CM) has no effect on follicular development (p>0.05),figure (2). These results are in agreement with that of Saporosi;et al.(14). There was strong correlation between (CMS) and follicular diameter in natural cycle (r =0.96). This result is well documented by Daly;et al. and Abidoqum ;et al.(16,17). We did not find such correlation in the "CC" stimulated cycle (r =0.15). This may need research by larger study group.

In conclusion these results suggest that (CMS) in natural cycle can be useful adjunct for monitoring ovulation in patients when hormonal analysis/ and or sonography are not available . Being simple to perform, cheap, rapid and reasonably accurate method for detecting and predicting ovulation. Cervical scoring assessment is recommended for the use in infertility management in our environment with limited man power and resources. In addition U/S is found to be cost effective in the over all infertility evaluation . The Insler score is reliable indicator for follicular growth and rupture.It is easy mastered and there is minimal individual variation between observers and no technical or biochemical facilities are
required. Clomiphene Citrate stimulated cycle needs research by larger study group.

References
Table(1): Insler Mucus Score:

<table>
<thead>
<tr>
<th>Quantity of fluid aspirated \ml</th>
<th>Grade</th>
<th>Degree of external os opening</th>
<th>Grade</th>
<th>Ferning</th>
<th>Grade</th>
<th>Spinberkiting</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.1-0.2</td>
<td>1</td>
<td>Closed with out mucus</td>
<td>1</td>
<td>Few</td>
<td>1</td>
<td>3-6</td>
<td>1</td>
</tr>
<tr>
<td>0.3-0.4</td>
<td>2</td>
<td>Closed with mucus</td>
<td>2</td>
<td>Moderate</td>
<td>2</td>
<td>7-9</td>
<td>2</td>
</tr>
<tr>
<td>&lt;0.5</td>
<td>3</td>
<td>Opened with mucus</td>
<td>3</td>
<td>Sufficient</td>
<td>3</td>
<td>10-12</td>
<td>3</td>
</tr>
</tbody>
</table>

Score <5 = Hostile cervical secretion
Score: 5-10 = Relatively unfavorable CM
Score >10 = Favorable CM

Figure(1): Comparison between (CMS) in natural and stimulated cycle (The values are the median)

Number of patients per group = 11
Natural is significantly different from the corresponding group. (p<0.05)

Number of patients per group = 11

There is no significant difference (p>0.05)
Abstract
From Feb. 1999 to Feb. 2001, There were 1000 patients to be treated for burn in Hilla Surgical Teaching Hospital burn unit in Babylon.

-596 male patients (59.6 %), 404 female (40.4 %).
-660 (66%) of cases were children, young adults 330 (33%), and old age group form 10 (1%). The vast majority of cases fall in the group of moderate to major burns.

Flame burn formed 653 (65.3 %), 332 (33.2%) cases hot liquid, and 15 (1.5%) sustained electric burn. -100 patients (10%) treated surgically. Hospital stay extended from 1-12 weeks. Bacterial study showed 54% pseudomonas, staph. Aureus 22%, Klebsiella 13% Proteus 9% and E coli 2%, 175 patients died due to:
- inhalation injury 55%, septicemia 44%, G. I. bleeding one case.

The study has shown the burn injury problem as a major national health problem, and prolonged morbidity and temporary or permanent disability associated with it to result in staggering economic drain on social resources and financial support is required. Prophylaxis against burn is better than treatment. Teamwork approach to burn care is found to be of great importance. This study can be regarded as a message to whom it may concern.

Introduction
Burn is a tissue injury in which there is acoagulation necrosis of tissues from thermal application or from absorption of physical energy of chemical contact. (1)

No one is immune from thermal injury . (1)

Burn injury problem is anatonical health problem with an evident difficulty in management and which may result in prolonged morbidity and disability which may highlight the importance of prevention such injuries .

The factors which affect the severity and prognosis of burn injuries are:
1- Total body surface area burn (T. B. S. A )
2- The depth of the burn.
3- The complications which may occur.
4- Associated medical illnesses or injuries .

With well planned and proper management protocol the prognosis can be improved.

Patients and Methods
From Feb. 1999 to Feb. 2001 aclinical prospective study in Hilla Surgical Teaching Hospital was
accomplished in the burn unit on 1000 patients of both sexes, all age groups and on different kinds of burn injuries. Parenteral fluid resuscitation used from the admission when needed usually with Ringer lactate, Normal Saline, Glucose Saline, Glucose Water. Plasma and blood transfusion given as required. Systemic Antibiotics are given from the start as prophylaxis, usually with penicillin then changed on need according to the clinical status of the patient and the wound and according to the results of culture and sensitivity test of wound swabs. The patients submitted to daily cleaning of the wounds and local application of Antibacterial preparations, such as Silver Sulphadiazine cream, Hibitane cream, Celavex cream, Soframycin, Garamycin cream according to the need of the patient and the availability of the drugs. The vast majority of patients wounds heal spontaneously on conservative line of treatment. 100 Patients needed surgical interference in the form of wound excision and skin graft with very good results functionally and esthetically. Early physiotherapy afford to the patients. After discharge of the patients they were followed up for some time depending on their need and their cooperation ranging from one visit to multiple visits along more than 1.5 year. The patients who had died were refered to the forensic medical department.

**Results**

**Sex incidence:**
No. Of male patients =596 (59.6)
No. Of female patients =404 (40.4)
Male / female ratio =1.4 / 1

**Age incidence:**
No. Of children = 660 (66%)
No. Of young adults =330 (33%)
Old age group =10 (1 %)

**Severity of Burn:**
Major Burn =180 cases (18 %)
Moderate Burn = 455 cases (45.5 %)
Minor burn =365 cases (36.5 %)

**Type of Burn:**
Flame Burn = 653 cases (65.3 %)
Hot Liquid Burn =332 cases (33.2 %)
Electrical Burn = 15 cases (1.5 %)

**Sites of burn:**
The majority of patients sustained burns of more than one site of the body at the same time
Head and neck = 205 cases (20.5 %)
Trunk = 470 cases (47 %)
Upper limbs =275 cases (27.5 %)
Lower limbs =305 cases (30.5 %)
Genitalia = 60 cases (6 %)

**Type of Treatment:**
Conservative Treatment = 900 cases (90 %)
Surgical Treatment =100 cases (10 %)
One section of skin grafting =60 cases
Two sections of grafting =30 cases
Three sections of grafting =10 cases
No skin graft failure occured.

**Seasonal incidence:**
December = 135 cases (13.5 %)
March =105 cases (10.5 %)
January =103 cases (10.3 %)
Other months = 60 -70 cases amonth

**Hospital Stay**
Up to one week =575 cases (57.5 %)
2-4 weeks =370 cases (37 %)
5-8 weeks =46 cases (4.6 %)
9-12 weeks = 9 cases (0.9 %)

**Cooperation of patients**
60 – 70 % of patients and their companion were uncooperative concerning compliance with medications, local wound care, positioning, physiotherapy, and feeding.

**Bacteriological study of burn wounds**
Wound swabs taken 3-5 days post burn. Positive cultures form 25 % of the swabs
Psuedomonas aeroginosa =54 %
Staph. Aureu =22%
Klebsiella = 13 %
Proteus = 9 %
E. coli =2 %

**Mortality**
Total number of deaths is 175 patients (17.5 %.)
Inhalation injury =96 patients ( 9.6 %).
Septicemia =78 patients (7.8 %).
G.I. Bleeding =1 patient. (0.1 %)

**Discussion**
The management of burn patients is known to be one of the most difficult tasks that demands a great deal of efforts, knowledge, experience, patience, and team work approach and is found to be one of the medical problems that is surrounded by an evident deal of controversy.

Burn management demands cooperation and coordination of many specialties and well trained personnel but unfortunately we lack this in our burn unit.

Children form a significant number of cases 66% which indicates the carelessness and in adequate follow up by the family in addition to low precaution level in the presence of the old fashion methods of cooking, heating, and lighting.

The vast majority of patients fall in the group of moderate to major burns which results in burn of more than one site of the body at time which can denote the size of efforts and facilities needed and the extent of morbidity and mortality.

The majority of burns were found to be of flame type which could be related to the use of fire for lighting, heating and cooking.
Our approach of treatment is late wound excision and skin grafting (2-3 weeks post burn) because we have no material and equipment facilities and personnel available to perform early wound excision and grafting.

Our results were excellent and no graft failure occurred.

Cooperation of patients and their companion found to be disappointing (60-70% uncooperative), and so we can imagine the difficulty of management of these patients and how can this be reflected on the results.

The seasonal incidence of burn injury from the previous incidence which we used to know in which we got peak incidence on cold months, but in this study we found that the majority of the cold and hot months have got approximate incidence, this can be related to the shortage of electricity power supply of the governorate (Babylon) which is all over the year.

25% of the swabs taken 3-5 days post injury were positive with dominance of pseudomonas and staphylococcus aureus. This result can be improved by increasing care and support to the burn unit.

Mortality rate was 17.5% is relatively comparable to that of Yorkshire regional Burn center (1966-1983) which was 16% (5).

This rate may be decreased by improving the standard of service afforded to the patient

Conclusion
The study has shown the burn injury problem as a major national health problem and the prolonged morbidity and temporary or permanent disability associated with it result in staggering economic drain in social resources and financial support is required.

Prophylaxis against burn is better than treatment and the whole society should be fire cautious.

Care of burn patient is optimized when an organized team with a thorough understanding of burn pathophysiology develops and implements an plan to prevent further complications.

References
1- Cheryl Lalonde, "Burn Trauma", 1989.
Abstract:
The size and shape of the arches have considerable implications in orthodontics diagnosis and treatment planning, affecting the space available, dental esthetics, and stability of the dentition. From the dental cast, one can analyze tooth size and shape, alignment and rotations of the teeth, presence or absence of teeth, arch form and symmetry, and arch width and occlusal relationship. This study was performed using dental casts for upper and lower arches of a total of 38 subjects with class II, division 1 malocclusions (17 males and 21 females) and of 40 normal class I subjects (20 males and 20 females) of Iraqi adult samples aged (14-24) in Hilla city. The dental and arch width dimensions measured were intercanine, intermolar, and molar alveolar in both arches to compare the transverse dimensions of the dental and alveolar arches of class II malocclusion groups with normal class I occlusion subjects and independent-samples t-test was applied for comparisons of the groups.

The finding from this investigated indicated that, (1) there were no significantly differences in all measurements between class I and class II overall samples (2) there were no significantly differences in all measurements between class I and class II male samples except for mandibular inter canine widths (L3-3) were significantly larger in class II than in class I male samples (3) there were no significantly differences in all measurements between class I and class II female samples except for mandibular molar alveolar widths (LA6-6) were significantly larger in class II than in class I female samples (4) most of the dental and alveolar widths measurements in overall, male and female class II samples were insignificantly slightly larger than in class I overall, male and female samples. These indicates that there were no posterior crossbite tendency in the class II groups.

الخلاصة:
إن حجم وشكل الفكين لهما دور كبير في تشخيص وطرق العلاج في تقويم الأسنان ويؤثر على الفضاء المتوفى، وجمالية الأسنان واستقرار الأسنان. ومن خلال قوالب الأسنان يمكن أن نحلل حجم وشكل الأسنان واصطدامه ودور الأسنان وجود أو غياب الأسنان وشكلا وتشاجر الفكين وعرض الفكين والعلاقة الانطباعية للفكين. هذه الدراسة تمت باستخدام قوالب الأسنان للفكين الأعلى والأسفل لمجموعة (38) شخص للصف الثاني، الصف الأول من سوء الإطباقي (17 ذكر و 21 أنثى)، (40) شخص للصف الأول للإطباقي الطبيعي (20 ذكر و 20 أنثى) من عينات العراقيين البالغين أعمارهم (14-24) سنة في مدينة الحلة. ان أبعاد الحول للفكين الخلفي كانت ما بين النيب وما بين الأضراس وما بين الحويصلي الضرسي في كلتا الفكين لمسافة الأبعاد المستعرضة للفكين الخلفي مفيدة الأبعاد من سوء
**Introduction**

Information concerning the upper and lower arches dimensions in human populations are important to clinical orthodontic diagnosis and treatment planning (1, 2). Investigators have studied the growth of arch widths in persons with normal occlusion, arch widths in adults with normal occlusion, and compared these values with those of different malocclusion samples, however, there is considerable controversy among the results presented in the literature (3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18). The results reported by Tollaro et al (11) were from II-1 children with posterior transverse interarch discrepancy. Bishara et al(12) compared interarch differences in intercanine and intermolar widths cross-sectionally in children and found similarity between II-1 and normal occlusions. In male patients only, longitudinal curves based on interarch differences had a greater magnitude in normal occlusions than in II-1(12). One adult study found that normal occlusion male patients had larger arch widths than female patients for five of six arch widths, whereas II-1 male patients had larger widths than female patients for only maxillary and mandibular alveolar widths. One adult study found that normal occlusion male patients had larger arch widths than female patients for five of six arch widths, whereas II-1 male patients had larger widths than female patients for only maxillary and mandibular alveolar widths(8). Uysal et al findings that the maxillary interpremolar width, maxillary canine, premolar and molar alveolar widths, and mandibular premolar and molar alveolar widths were significantly narrower in subjects with Class II division 1 malocclusion than in the normal occlusion sample, maxillary molar teeth in subjects with Class II division 1 malocclusions tend to incline to the buccal to compensate the insufficient alveolar base(4)

The literature review indicates that the width of the dental arches in subjects with Class II, Division 1 malocclusions was found to be either normal or narrower than the corresponding widths of normal subjects. Such a discrepancy may be attributed to
differences in the absolute size of the dental arches in the various Class II samples compared (12). A more relevant approach is to calculate and compare the differences between the maxillary and the mandibular arch widths in subjects with Class II, Division 1 malocclusions and normal subjects (8). Huth, et al. who studies subjects of white Americans with no history of orthodontic treatment which compare arch widths in adults with Class II division 2 (II-2), Class II division 1 (II-1), and Class I normal occlusions all groups had similar mandibular intercanine and alveolar widths. The Class II division 2 and Class II division 1 groups had similar mandibular intermolar widths, both smaller than normal occlusions. The Class II division 2 and Class II division 1 groups had similar maxillary/mandibular differences in intercanine and alveolar widths, both smaller than normal occlusions(19). Furthermore, it would be of interest to determine whether the tendency for a transverse discrepancy found in the adult Class II dentition is also expressed in the earlier stages of dental arch development. The literature review indicates that when comparing Class II and normal occlusions, gender differences appear to be important. Therefore, both gender and gender pooled comparisons were made in this study. The objectives of this study were to determined the differences between the transverse dimensions of the dental arches and alveolar widths of Class II division 1 malocclusion groups with the transverse measurements of untreated normal occlusion subjects in over all samples and with in each sex. Another objective was to develop norms for adult arch widths using data from the Class I normal subjects.

**Materials and Methods**

All subjects were Iraqi adult sample with no orthodontic treatment. Records for 78 subjects included plaster casts with fully erupted permanent incisors, canines, premolars, and first molars. Lateral cephalograms were available for all. A sample of 40 subjects, 20 male and 20 female, with Class I normal occlusion was selected from the Department of Orthodontics in the college of dentistry of Babylon university and specialized center of orthodontic in Hilla city. the following inclusion criteria were used to collect this sample(21, 22, 4, 19) : (1) teeth well aligned within the dental arches with less than 3 mm of crowding or spacing, (2) overjet not more than 4 mm (3) first molars bilaterally Class I in centric occlusion, (4) no teeth in crossbite, (5) normal growth and development, (6) all teeth present except third molars, (7) good facial symmetry determined clinically, (8) no significant medical history, and (9) no
history of trauma, and no previous orthodontic, prosthodontic treatment, maxillofacial or plastic surgery. A sample of 38 Class II division 1 subjects, 17 male and 21 female, was selected from the records of patients who were came to the Department of Orthodontics in the college of dentistry of Babylon university and specialized center of orthodontic in Hilla city. The following inclusion criteria were used to select this sample (21, 23, 22, 24, 25) : (1) maxillary incisors labially inclined, (2) overjet greater than 7.5 mm, and (3) first molars bilaterally full Class II in centric occlusion. (4) no significant medical history; and (5) no history of trauma, and no previous orthodontic, prosthodontic treatment, maxillofacial or plastic surgery. The minimum age of the subjects chosen for this study was based on earlier evidence reporting no significant change in first molar and canine arch widths after age 13 in girls and age 16 in boys. Six arch width measurements were taken with dial calipers on the dental casts of each subject: (12, 26, 2, 4, 19)

(1) maxillary intercanine width between the cusp tips, (U 3-3)

(2) maxillary intermolar width between the tips of the mesiobuccal cusps of the first molars (U6-6).

(3) maxillary molar alveolar width at the mucogingival junctions above the mesiobuccal cusp tips of the first molars (UA 6-6).

(4) mandibular molar alveolar width at the mucogingival junctions below the buccal grooves of the first molars (LA6-6).

(5) mandibular intermolar width between points on the main buccal grooves located vertically at the middle of the buccal surfaces of the first molars(L 6-6).

(6) mandibular intercanine width between the cusp tips (L 3-3) (Figure 1).

Arch widths were measured with a dial calipers to the nearest 0.05 mm. Two measurements were taken at separate times for each variable measured. The intra-examiner correlations between first and second measurements for the six variables ranged from $r = .95$ to $r = .98$. The average of the first and second measurements was used for data analysis. Interexaminer correlations averaged $r = .93$. Computer software SPSS © Vs. 12.0 (statistical package for the Social Science, Inc. 1989-2003 Copyright) was used to analyze the statistical data obtained from this study. Descriptive statistics were computed and the Independent-samples t-test was applied to compare the transverse dimensions of the dental arches and alveolar widths of Class II division 1 malocclusion groups.
with the transverse measurements of untreated normal occlusion subjects in over all samples and with in each sex.

Aims of the study to determine

(1) the dental and alveolar arch widths in normal occlusion and in class II division 1 malocclusion.
(2) the differences in the dental and alveolar arch widths between:-
(a) Class I and class II division 1 malocclusion in overall samples.
(b) Class I and class II division 1 malocclusion with each sex.

Results

The sample of this study is 78 subject consisting of 40 class I mean age (21 years), 20 males the mean age (20.86 years) and 20 females the mean age (21.22 years ) and 38 class II division 1 the mean age (19.3 years), 17 males the mean age (19.71 years) and 21 females the mean age (19.07 years) as demonstrated in Table (1). The descriptive statistic, including mean, standard deviations, minimum and maximum value of all variables for the total sample of class I and C1 II division 1, both the males and female group of class I
and class II division I are present in tables (2), (3), (4).

Comparison of the dental and alveolar arch widths measurements between normal class I and class II overall samples: (Table 2)
The comparison of measurements between normal class I and class II overall samples demonstrated in table (2). All measurements were larger in class II sample than in class I sample except for upper intermolar width were larger in class I than in class II sample, however, these differences are very small in magnitude. For normal class I and class II, there were no statistically significant difference for the all measurements at P > 0.05.

Comparison of the dental and alveolar arch widths measurements between normal class I and class II male samples: (Table 3)
The comparison of measurements between normal class I and class II male samples demonstrated in table (3), indicated that there were no significant differences between them except for the lower intercanine widths (L3-3) were significantly larger in class II than in normal class I male samples at P < 0.05. All measurement were larger in class II than in class I male sample except for upper intermolar width were slightly larger in class I than in class II sample but these differences were not significant at P > 0.05.

Comparison of the dental and alveolar arch widths measurements between normal class I and class II female samples: (Table 4)
The comparison of measurements between normal class I and class II female samples demonstrated in table (4) indicated that all measurements were larger in class II than in class I females sample except for upper molar alveolar width were slightly larger in class I than in class II females sample. But these differences were not significant at P > 0.05. Except for the lower molar alveolar width (LA6-6) were significantly larger in class II than in class I female sample at P < 0.05.

Discussion
Study and determination of criterion for different ethnic groups is essential to promote accurate diagnosis and planning for orthodontic treatment. Each ethnic group has certain characteristics that should not be taken as standards for other areas with different developmental and ecological foundation (27). So the differences that have been observed in this study of arch width in class I & class II with the findings of other studies may be
attributed to the following factors [Ethnic variations, sample size, method of study, age of subjects and gender dimorphism]

In spite of many studies in Iraq deal with these measurements, the present study adds new information about the dental and alveolar arch widths in class I normal occlusion and class II malocclusion. The measurements, that available in the present study are specified for age and sex for Iraqi population in Hilla city in an attempt to provide a data for orthodontic diagnosis and treatment planning.

Investigators who studied growth changes in the transverse arch width found that molar and canine arch widths did not change after age 13 in female subjects and age 16 in male subjects (2,7). The minimum ages of the subjects measured in this study were chosen on the basis of these previous studies. There fore, we assumed that the arch widths of the subjects studied were fully developed. In the normal occlusion sample only subjects with minor or no crowding were included, whereas the absence of crowding was not a criterion in the class II groups. If a class I group with crowding would be compared with a class I group without crowding, most probably narrower arches would be found in the class I group with crowding. For that reason, group differences in this study may be the result of differences concerning crowding as well and our results must be interpreted carefully.

**Comparison between overall sample class I and class II**

Generally the comparison of measurements between overall class II and class I samples is present in table (2).

(I) **Maxillary dental and alveolar arch widths**:

Were no significant differences are found in maxillary intercanine widths(U3-3) between overall sample normal class I and overall sample class II at P>0.05, this finding in agreement with the finding of (4, 5, 10, 12), but in contrasting to the finding of (8, 3) which reported that subjects with normal occlusion had larger maxillary inter canine widths than the class II malocclusion subjects.

The maxillary intermolar width (U6-6) in this present study are no significant differences between class I and class II samples at P > 0.05, this finding are similar to the finding of (5, 19) but this finding are disagree with (3, 11, 8, 10, 19) who found that the maxillary intermolar width were significantly larger in class I than in class II overall sample and also disagree with the finding of (4) who found that the maxillary intermolar width were
significantly larger in class II than in class I overall sample. The maxillary molar alveolar width (UA6-6) in this present study were no significant differences between class I and class II overall sample at P > 0.05 on the other hand, this measurement was significantly larger in class I than in class II overall sample (19, 4).

**II) Mandibular dental and alveolar arch widths:**

In this present study, there are no significant differences were found in mandibular intercanine width (L3-3) between class I and class II overall sample at P>0.05, this finding were similar to the finding of (19, 3, 5, 12, 8) but disagree with the finding of (4,10) who founds that mandibular intercanine widths were significantly larger in the class II than in class I overall sample. The mandibular intermolar width (L6-6) in this present study are no significant differences between class I and class II overall sample at P > 0.05 as similar to the finding of (5, 11) but in contrasting to the finding of (3, 19) who founds that the mandibular intermolar width were significantly larger in class I than in class II overall sample, and also disagree with the result of (4) who reported that intermolar width were larger in patients with class II were compared with the class I overall samples. The mandibular molar alveolar width (LA6-6) in this present study are no significant differences between class I and class II overall sample at P > 0.05, this result comes in accordance with (19) but disagree with the finding of (4) who founds that the mandibular molar alveolar widths were significantly narrower in class II than in class I overall sample.

**Comparison between Class I and Class II Male samples:**

Generally the comparison of the measurements between class I and class II male samples is present in table (3).

**I) Maxillary dental and alveolar arch widths:**

In this present study, there are no significantly differences are found in maxillary inter canine width (U3-3) between male samples of class I and class II at P > 0.05 this finding are in contracting to the finding of (19, 8, 9) which founded that subjects with normal occlusion had larger maxillary intercanine widths than class II malocclusion subjects. The maxillary intermolar width (U6-6) in this present study are no significantly differences between class I and class II male samples at P > 0.05 this finding are in contrasting to the finding of (19, 8, 9) which founded that subjects with normal class I had larger maxillary intermolar widths than class II malocclusion subjects.
maxillary molar alveolar width (UA6-6) in this present study are no significantly differences between class I and class II male samples at P > 0.05, this finding are in contrasting with the finding of (19, 8) who found that subjects with class I normal occlusion had larger maxillary molar alveolar widths (UA6-6) than class II malocclusion subjects.

(II) Mandibular dental and alveolar arch widths:
In this present study, the mandibular intercanine widths (L3-3) are found to be significantly larger in class II than in class I male samples at P > 0.05, but it differs from the findings of (19, 8) on there comparison between class I and class II male samples in which no significant difference was observed in regards to the mandibular intercanine widths (L3-3). The mandibular intermolar widths (L6-6) in this present study are no significantly differences between class I and class II male samples at P > 0.05, this finding are supported by the (9, 6, 7). But it differs from the finding of (19, 8, 6, 11) in which the mandibular intermolar width (L6-6) were significantly larger in class I than class II male samples. The mandibular molar alveolar width (LA6-6) in this present study are no significantly differences between class I and class II male samples at P > 0.05, this finding are supported by the (19) but disagree with finding of (8) who found that the mandibular molar alveolar width (LA6-6) were significantly larger in class I than class II male samples.

Comparison between class I and class II Female samples
Generally the comparison of the measurements between class I and class II female samples is present in table (4).

(I) Maxillary dental and alveolar arch widths:
In this present study, there are no significantly differences are found in maxillary inter canine width (U3-3) between female samples of class I and class II at P > 0.05. This finding are similar to the finding of (19, 10) but disagree with the finding of (8, 9) who founds that the maxillary intercanine width (U3-3) were larger in class I than in class II female samples. In this present study there are no significantly differences between class I and class II female samples in the maxillary intermolar width (U6-6) at P > 0.05. Conversely (19, 8, 10, 9, 7), stated that the maxillary intermolar width (U6-6) were larger in class I than in class II female samples. The maxillary molar alveolar widths (UA6-6) in this present study are no significantly differences between class I and class II female samples at P > 0.05, this finding are supported by (10) but disagree with
(19, 8) who stated that the maxillary molar alveolar widths (UA6-6) were larger in class I than in class II female samples.

(I) Mandibular dental and alveolar arch widths:
The mandibular intercanine width (L3-3) in this present study are no significantly differences between class I and class II female samples at $P > 0.05$. This finding are agree with the finding of (19, 8) but disagree with the finding of (10) who found that the mandibular intercanine width were larger in class II than in class I female samples. The mandibular intermolar width (L6-6) in this present study are no significantly differences between class I and class II female samples at $P > 0.05$. This finding are supported by finding of (8, 10, 7) but this finding in contracting with (19, 9) that the mandibular intermolar width (L6-6) were larger in class I than in class II female samples. The mandibular molar alveolar widths (UA6-6) in this present study are significantly larger in class II than in class I female sample at $P < 0.05$, this finding are disagree with (19, 8, 10) that the mandibular molar alveolar width (LA6-6) were no significantly differences between class I and class II female samples.

**Conclusion**

1- There were no significantly differences in all measurements between class I and class II overall samples.

2- There were no significantly differences in all measurements between class I and class II male samples except for mandibular intercanine widths (L3-3) were significantly larger in class II than in class I male samples.

3- There were no significantly differences in all measurements between class I and class II female samples except for mandibular molar alveolar widths (LA6-6) were significantly larger in class II than in class I female samples.

4- Most of the dental and alveolar widths measurements in overall, male and female class II samples were insignificantly slightly larger than in class I overall, male and female samples. These indicates that there were no posterior crossbite tendency in the class II groups.
References


2. Al-Zubair N.M.M. Maxillary and mandibular dental arch dimensions and forms in a sample of Yemeni population aged (18-26) years with class I normal occlusion. 2002; Master Thesis, Baghdad University.


Table (1) The Distribution of Age in years of Class I and Class II samples

<table>
<thead>
<tr>
<th>Sample</th>
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<th>Mean. Y</th>
<th>S.D.Y</th>
<th>Maximum. Y</th>
<th>Minimum. Y</th>
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<td>14</td>
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<td>23</td>
<td>16</td>
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</tr>
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</table>

C1 I = class I;  C1 II = class II,  
S.D = standard deviation.  
No. of class I= 40(males= 20 and females= 20)  
No. of class II = 38 (males= 17 and females= 21) , Y = years

Table (2) Descriptive statistics of the dental and alveolar arch widths measurements in millimeters and t- test between overall samples of class I and class II

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Class</th>
<th>Mean</th>
<th>S.D</th>
<th>Maximum</th>
<th>Minimum</th>
<th>P- Value</th>
<th>Sig. *</th>
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C1 I = class I;  C1 II = class II;  
S.D = standard deviation,  
N.S= not significant at P > 0.05,  
No. of overall class I sample = (40) (20 males and 20 females),  
No. of overall class II sample = (38) (17 males and 21 females)
Table (3) Descriptive statistics of the dental and alveolar arch widths measurements in millimeters and $t$-test between males samples of class I and class II

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Class</th>
<th>Mean</th>
<th>S.D</th>
<th>Maximum</th>
<th>Minimum</th>
<th>P- Value</th>
<th>Sig. *</th>
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<td><strong>U 3-3</strong></td>
<td>C1 I</td>
<td>35.84</td>
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C1 I = class I;  C1 II = class II;  S.D = standard deviation

*N.S= not significant,
S= significant  at P < 0.05
No. of males class I sample = 20
No. of males class II sample = 17
Table (4) Descriptive statistics of the dental and alveolar arch widths measurements in millimeters and t- test between females samples of class I and class II

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Class</th>
<th>Mean</th>
<th>S.D</th>
<th>Maximum</th>
<th>Minimum</th>
<th>P-Value</th>
<th>Sig.*</th>
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</table>

C1 I = class I;  C1 II = class II;
S.D = standard deviation
*N.S= not significant,
S= significant  at P < 0.05
No. of females class I sample = 20.
No. of females class II sample = 21