

**Consanguinity marriage and fertility outcome health
in the middle Euphrates of Iraq**

H. R. Mubarek AL-Rekaby

University of Thi-Qar - College of Education - Department of Biology

ABSTRACT

The inbreeding coefficient refers to the degree of advancing of any society. In 2006 an experiment was conducted to find the inbreeding coefficient in the middle Euphrates area of Iraq (Al-Qadisiya and Babylon) and to study the relationship between the related and unrelated marriages as well as reproductive parameters. Results indicated that inbreeding coefficient was ($F=0.0167$).

The percentage of unrelated marriage was higher in (Al-Qadisiya 44.9% compared to Babylon 36.5%) and the total was 55.3% Non-fertile families in middle Euphrates region was 2.5% No relationship was found between fertility outcome and consanguineous, non-consanguineous marriage.

INTRODUCTION

The consanguineous marriage in human has been studied in different area of the world and is considered by some investigators as a characteristic of society (1). The rate of this type of marriage is different in different countries. For example in Japan this rate was about 16% in 1950 and changed to 4.6% in 1988(2). In the Arab world this rate ranged from 30-40 % (3). The rate of the consanguinity marriage and its change is related to several factors such as; religion, socio-economic factors, education and race that dominate in the society (1).

Another factor that is of important in the consanguinity marriage is the inbreeding coefficient. This is considered as an important indicator of the advancing level of a target society in several aspects of life.

Al-Rekaby (4,5) and Mubarek(6) reported that difference in the consanguineous marriage usually refers to the correlation in the inbreeding coefficient of the target population and its rate of reproductive parameters. Those reproductive parameters include: spontaneous abortion, fetal death and neonatal death (7).

The rate of consanguineous marriage in Iraq is considered to be very high. Recent report (7) estimated this rate to be 0.0225. Al-Rekaby (4,5) estimated this factor to be 0.027, 0.020 respectively.

The purpose of this study is determining the consanguinity rate of the middle Euphrates region of Iraq (Al-Qadisiyia and Babylon). And to present a comparative data on reproductive parameters of the two provinces as well as to find the effect of consanguineous marriage on the reproductive parameters

such as; spontaneous abortion, fetal death, neonatal death.

Materials and Methods

This study was conducted in 2006 in the middle Euphrates region of Iraq; Al-Qadisiyia and Babylon provinces. This study was performed on 587 families in Al-Qadisiyia and 760 families in Babylon. Each family was handed a comprehensive sheet of questionnaire including an extensive pedigree analysis, reproductive parameters and consanguinity of parents.

The inbreeding coefficient of consanguineous marriages of the two provinces and for the region was obtained (8). In this method the inbreeding coefficient for the unrelated is considered to be zero. The percent analysis was used as a method to find the percentage of the pedigree of marriages. Relationships between all reproductive parameters of the fertile families (families which have a potential of pregnancy within five years of marriage); parity and consanguineous marriages were calculated (1, 2, 8, 9).

According to Al-Hamamy (11) the consanguineous marriages was rated as follow; the first cousins, second cousins and third cousins.

Data were analysis by use of 2*2 contingency chi-square test.

Results

Inbreeding coefficient of middle Euphrates region of Iraq was 0.0167. The percentage of the unrelated for Al-Qadisiyia and Babylon and for the total are 44.9%, 36.5% and 40.2 respectively (Tables 1 and 2). These percentages (of the unrelated were changed in to 56.5%, 54.4% and 55.3% respectively when the third cousin was added to the unrelated Table 3. The percent of non-fertile

families in Al-Qadisiyia and Babylon were 2.2% and 2.7%, respectively and for the middle Euphrates region was found to be 2.5% (Table 4).The relation between consanguineous, non

consanguineous marriage and the affected (i.e. abortion, fetal death and neonatal death) is 46% for Al-Qadisiyia and 55.2% for Babylon (Table 5).

Table-1- F=0.0167 Inbreeding coefficient in middle Euphrates area
Consanguineous marriages and non consanguineous marriages among spouses
In middle Euphrates area of Iraq

Degree of consanguinity	Non-consanguineous unrelated group	consanguineous (related) group			Total
		1 st cousins marriage	2 nd cousins marriage	3 rd cousins marriage	
Number	542	295	263	247	1347
Percentage	40.2	21.9	19.5	18.3	99.9

Table-2- Distribution of Consanguineous marriages and non consanguineous marriages in two provinces in middle Euphrates area

Degree of consanguinity	Al-Qadisiyia province		Babylon province		Total	
	number	percentage	number	percentage	number	percentage
Unrelated	264	44.9	278	36.5	542	40.2
First cousins	120	20.4	175	23.0	295	21.9
Second cousins	107	18.2	156	20.5	263	19.5
Third cousins	96	16.3	151	19.8	247	18.3
Total	587	43.5	760	56.4	1347	

Table-3- Degree of Consanguineous marriages and non consanguineous marriages in middle Euphrates area

Degree of consanguinity	Al-Qadisiyia province		Babylon province		Total	%
	No.	%	No.	%		
Unrelated Consanguineous marriages	332	56.5	414	54.4	746	55.3
First cousins	133	22.6	182	23.9	315	23.3
Second cousins	122	20.7	164	21.5	286	21.2
Total	587	43.5	760	56.4	1347	

Table-4- Number of fertile and non fertile spouses in middle Euphrates area

Sample	Number of couples	Fertile families		Non fertile families	
		No.	%	No.	%
Al-Qadisiyia province	587	574	97.7	13	2.2
Babylon province	760	739	97.2	21	2.7
Total	1347	1313	97.4	34	2.5

Table-5- The percentage of affected families in related and unrelated marriage in middle Euphrates area in Iraq

Degree of consanguinity	Al-Qadisiyia province			Babylon province			Total		
	Total families	Affected families	%	Total families	Affected families	%	All families	Affected families	%
unrelated	342	138	40.3	429	186	43.3	771	324	42.0
related	245	150	61.2	331	152	45.9	576	302	52.4
Total	587	288	49.0	760	338	44.4	1347	914	67.8
% of affected families			46.0			55.2			

Table-6- Spontaneous abortion in consanguineous marriage and non consanguineous marriages in middle Euphrates area in Iraq

Degree of consanguinity	Al-Qadisiyia province			Babylon province				Total			2 x 2 test p<0.01 compared with unrelated
	Parity	Spontaneous abortion	%	parity	Spontaneous abortion	%	2 x 2 test p<0.01	parity	Spontaneous abortion	%	
Unrelated	1393	47	3.3	1663	98	5.9	6.9	3056	145	4.7	
First cousins	417	35	8.3	796	77	9.7	0.3	1213	112	9.2	19.5
Second cousins	308	21	6.8	489	35	7.1	0.1	797	56	7.0	4.9
Total	2118	103	4.8	2948	210	7.0	7.3	5066	313	6.1	5.3

Table-7- Fetal death in consanguineous marriage and non consanguineous marriages in middle Euphrates area in Iraq

Degree of consanguinity	Al-Qadisiyia province			Babylon province				Total			2 x 2 test p<0.01 compared with unrelated
	Parity	Fetal death	%	parity	Fetal death	%	2 x 2 test p<0.01	parity	Fetal death	%	
Unrelated	1393	28	2.3	1663	67	4.5	7.0	3056	95	3.1	
First cousins	417	25	5.9	796	14	1.8	0.02	1213	39	3.2	0.2
Second cousins	308	18	5.8	489	17	3.5	0.3	797	35	4.4	5.0
Total	2118	71	3.3	2948	98	3.3	5.3	5066	169	3.3	0.2

Table-8- Neonatal death (0-2 years) in consanguineous marriage and non consanguineous marriages in middle Euphrates area in Iraq

Degree of consanguinity	Al-Qadisiyia province			Babylon province			2 x 2 test p<0.01	Total			2 x 2 test p<0.01 compared with unrelated
	Still birth	(0-2) years infant mortality	%	Still birth	(0-2) years infant mortality	%		Still birth	(0-2) years infant mortality	%	
Unrelated	1030	36	3.4	1577	47	2.9	3.4	2607	83	3.1	
First cousins	423	15	3.5	888	24	2.7	0.002	1311	39	2.9	0.95
Second cousins	329	8	2.5	343	14	4.1	0.8	672	22	3.2	0.3
Total	1782	59	3.3	2808	85	3.0	2.0	4590	144	3.1	0.31

No significant differences were observed in the relationship between spontaneous abortion, fetal death and consanguineous, non consanguineous marriage in different parity (Tables 6 and 7). Also no significant differences were assessed between birth of consanguineous, non consanguineous families and neonatal mortality (0-2 years) in the southern region (Table 8).

DISCUSSION

The inbreeding coefficient in middle Euphrates region of Iraq (Al-Qadisiyia and Babylon provinces) was ($F=0.0167$). This number considered to be low if compared to inbreeding coefficient of the southern in Iraq obtained by Al-Rekaby (11), and when compared to Mosul province 0.02 (4). This indicated that standard level of marriage and education are progressively increasing for people living in this region. This is due to the eagerness of the people in the region to learn and to the removal of illiteracy. Our results agreed with Imazumi (8).

The increase in the unrelated marriages observed in tables (1, 2, 3) indicates that the society in this region is moving forward for better educational standards. This is probably related to the increase in industrial plants in the area which provides more job chances, a mixing society, enhancement financial,

social levels geographical variation and consequently the unrelated marriages were increased. The percentage of the non-fertile families in middle Euphrates area (Table 4) was normal when compared with the data obtained from Mosul (4) and considered high when compared with other part of the world (12).

The percentage of the affected families (Table 5) is considered very high when compared to results obtained from Mosul (4). And also when compared to the UNICEF. This may be related to environmental rather than to a genetic factor.

There was non significant relationship between spontaneous abortion and fetal death in the related and unrelated marriages in number of pregnancy for families of the two provinces individually and for the region (Table 6 and 7).

This indicates that no relationship existed between consanguineous marriages and parameters of reproductive health. The percentage of consanguineous and non consanguineous is in disagreement with (AL-Hamamy) (7), but agreed with Lindbohm *et.al* (13).

Abortion obtained from the first cousins is higher than that of the unrelated (Table 6). This suggests the importance of unrelated marriages. The nonsignificant differences in the

relationship between consanguineous, non-consanguineous marriages in number of birth and spontaneous abortion agreed with results obtained by AL-Hamamy *et.al* (9).

The nonsignificant differences in birth, neonatal death, consanguineous and non-consanguineous marriages (Table 8) are related to the similarities of the two provinces in the socio-economical as well as environmental factors.

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زواج الاقارب وصحة التكاثر في منطقة الفرات الاوسط من العراق

حسن ريسان مبارك الركابي

قسم علوم الحياة - كلية التربية - جامعة ذي قار

الخلاصة:

يشير معامل التزاوج الداخلي الى مدى تقدم المجتمع وتطوره. لذا اجري هذا البحث لايجاد أو تقصي واقع زواج الاقارب في منطقة الفرات الاوسط من العراق وشمل (القادسيه , بابل) . ودراسه العلاقة بين زواج الاقارب والغرباء ومؤشرات صحة التكاثر . اشارت النتائج ان معامل التزاوج الداخلي كان (٠,٠١٦٧) , كما بينت نتائج البحث ان نسبه عدم الاجاب في هذه المنطقه من العراق بلغ (٢٠,٥) % . كانت نسبه زواج الغرباء عاليه في محافظه القادسيه حيث بلغت (٤٤,٩) % مقارنة مع محافظه بابل حيث كانت (٣٦,٥) % والمجموع الكلي كان (٥٥,٣) % . لم تظهر النتائج فروقات واضحة لتأثير زواج الاقارب والغرباء على مؤشرات التكاثر المختلفة.