

The association between anemia and urinary tract infection among the pregnant women in Baghdad

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Summary:

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Background: Severe anaemia predisposes to infection particularly during pregnancy especially reproductive tract and urinary tract infection. Iron deficiency anemia is an important public health problem which contributes to morbidity and mortality in pregnant women, even milder anemia can cause urinary tract infection.

Methods: This study was carried out during February to May 2005 among 200 pregnant women during their routine visits to the maternal and child health centers in different parts of Baghdad city, they were inquired carefully about their ages parity, their gestational age and examined physically in addition to testing their blood for hb concentration and urine for presence of bacteruria.

The sample was divided into two groups: The first group had confirmed diagnosis with UTI (100), the second normal group (100) considered as a control. **Results:** The highest percentage of Urinary tract infected pregnant women in the sample were nullipara 44% and those in the second trimester showed highest percentage 57% of the sample. The mean blood hb was significantly lower in UTI cases (10.5 g/dl). The anemic individuals (<11 g/dl) constituted a significantly higher proportion (56%) of the UTI cases and the risk of having anemia in cases of UTI is 4.5 times that of the control.

Grand multipara with UTI increased the risk of having anemia significantly by 6.8 times compared to other and pregnant women with UTI in second trimester of pregnancy increased the risk of having anaemia 14.9 times.

Conclusion: We can conclude that there is an association between urinary tract infection and anemia of different causes during pregnancy there is a high risk of having anemia amongst the complicated pregnancy with UTI in association with their parity, age and gestational age.

Introduction:

Anemia develops in about a fourth of women whose pregnancy is complicated by pyelonephritis although its exact mechanism has not been defined clearly [1], and hemolysis with subsequent anemia in pregnant women with pyelonephritis is caused by lipopolysaccharide induced red blood cell membrane damage [2].

Severe anemia predisposes to infection particularly during pregnancy; it has been thought to increase the risk of thromboembolism, premature delivery, low birth weight, cardiac and respiratory infection and pyelonephritis [3]. Iron deficiency anemia is also an important public health problem which contributes to morbidity and mortality in women and young children, severe anemia in pregnant women increases the risk of maternal and fetal morbidity and mortality, milder degrees of anemia have been documented to be associated with low birth weight. Urinary tract, reproductive tract infection [4], so I hope to find in this study 1- the association between anemia and urinary tract infection among the

pregnant women in relation to their age parity and the gestational age in comparison to the normal pregnancy. 2- to assess the risk of having anemia after controlling for confounding effect of age parity and gestational age.

Subjects and methods:

This study was carried out amongst 100 pregnant women presented with complicated pregnancy by urinary tract infection and another 100 normal pregnant women randomly collected from the attendants of the maternal and child health centers scattered in different parts of Baghdad city, the 200 pregnant women were examined during the months of February to May 2005 and inquired about their ages, parity and the date of the last menstrual periods; their blood was tested for anemia by Sahli's method to find the Hb levels [5]. Anemia was classified according to the W.H.O. classification.

Hemoglobin levels more than 11 g/dl were considered as non anemic [3], the urine of each woman in the sample was collected by the mid-stream clean catch technique and examined under the microscope for the presence of bacteria, the presence of 100,000 bacterial colonies per ml in fresh voided urine considered as a positive infected urine [7].

The gestational age was detected by physical examination of the fundal levels and by abdominal

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ultra sound after calculation of the conception time by using the date of the last menstrual periods .

Results:

The results were based on the analysis of data collected from 200 pregnant females divided into two study groups , the cases group had a confirmed diagnosis of UTI (n=100), while the second group were labeled as controls (n=100) since their pregnancy was uneventful and had no signs of UTI in urine analysis . the ages of cases ranged between (14-41) years with a mean of 28.4 years (+/- 7.3 SI), while that of controls ranged between (16-45) years with a mean of 27.9 years (+/- 7.3 SI) the most patients with complicated pregnancy by UTI were nulliparas 44% of the sample while those pare (1-2) pregnant with UTI constituted 30% of the sample and those Para 3-4 and 51 constituted each 13% of the sample

In regarding the gestational age the pregnant with UTI showed lightest percentage in second trimester 57% and those in the third trimester 35% while in the first trimester only 8% as shown in table (1) In table (2)(the mean blood Hb concentration was significantly lower in UTI cases (10.5g/dl) compared to the controls (1

1.4g/dl).

The histogram showed left shifted curve of the normal cases for UTI case compared to controls.

In table(3) :the anemic individuals (<1 lg/dl) constituted a significantly higher proportion (56%) of UTI case compared to controls (22%) the risk of having anemia in cases of UTI is 4.5 limes that of controls.

Table(4) showed that UTI increased the risk of anemia in pregnancy 4.5 times compared to controls after adjusting for age , parity and gestational age .

Extremes of age were compared to average age (20-39) years older age groups did not alter the risk of having anemia compared to those with average while younger age (<20 years) increased the risk of having anemia by 1.9 times (although not statistically significant) . The grand muttiparas with UTI significantly increased the risk of having anemia 6.8 times compared to those with average parity (1-4) . While the nullipara cases affected by 2.3times compared to those with average parity (1-4) years . Also the second trimester of pregnancy with UTI increased significantly the risk of having anemia 14,9 limes in comparison with those in the first trimester while that found in the third trimester complicated pregnancy with UTI (11.6) if compared with the first trimester.

Table 1: Frequency distribution of study groups by age, parity and gestational age.

	Controls		Cases (UTI)	
	N	%	N	%
Age in years (groups)				
<20	13	13	8	8
20 - 29	48	48	47	47
30 - 39	31	31	36	36
40+	8	8	9	9
Parity (groups)				
Nullipara	39	39	44	44
1-2	37	37	30	30
3-4	18	18	13	13
5+	6	6	13	13
Gestational age (Trimester of pregnancy)				
First	7	7	8	8
Second	27	27	57	57
Third	66	66	35	35
Total	100	100	100	100

Table 2: Case-control difference in mean blood Hb concentration.

	Controls (n=100)	Cases (UTI) (n=100)
Blood Hb concentration (gm/dl)		
Range	(9.3 - 13.9)	(8.6 - 14)
Mean	11.4	10.5
SD	1	0.9
SE	0.1	0.09
P (t-test) < 0.001		

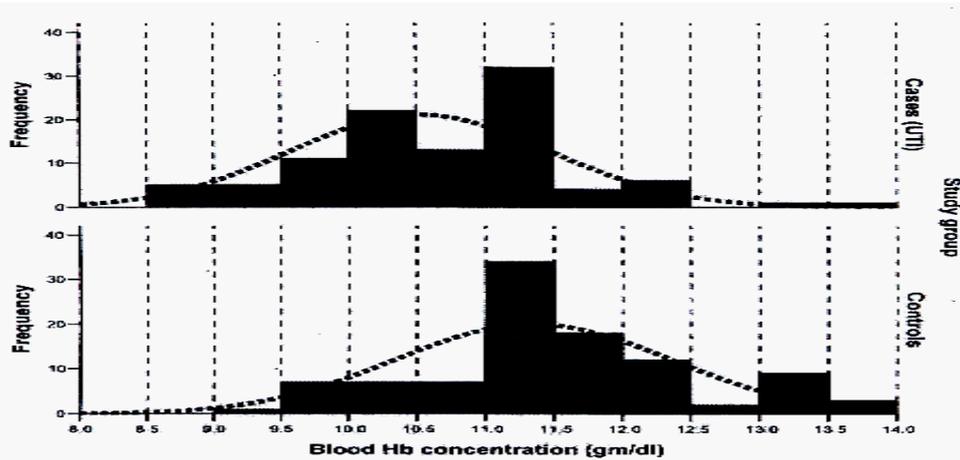


Table3: Case-control difference in the rate of anemia.

Study group	Total	Anemia (Hb<11)	
	N	N	%
Controls	100	22	22
Cases (UTI)	100	56	56

P <0.001. OR of being anemic in cases compared to controls = 4.5 (95% CI = 2.4-8.4).

Table 4: Multiple logistic regression model with the risk of being anemia as the dependent (response) variable and selected independent (explanatory) variables.

	OR	P
Cases with UTI compared to controls:	4.5	<0.001
Age		
Older age (40+) compared to those (20-39 years of age)	1.01	0.99[NS]
Younger age (<20) compared to those (20-39 years of age)	1.9	0.25[NS]
Parity		
Nullipara compared to those with average parity (1-4)	2.3	0.022
Grandmultipara compared to those with average parity (1-4)	6.8	0.003
Duration of pregnancy		
Second trimester compared to first	14.9	0.015
Third trimester compared to first	11.6	0.029
Predictive power of the model = 74%.		
P (model) < 0.001		

presence of 8.3% of asymptomatic bacteriuria compared to the control 3.1 % f 12]. But in 1995 MM.Radwan found that 11.8% were documented to have urinary tract infections among the sickle cell diseased anemic pregnant examined in his sample [13]. Also utilization of folate and iron found to be improved by elimination of infections affecting the UT or else were 114J. The lowest lib concentration among the pregnant with UTI was found in grand multiparas when the risk of having anemia increased 6.8 times compared to the control that could be due to the larger increase of plasma volume during pregnancy but small increase may occur in association with placental insufficiency or with folate deficiency [3]. The pregnant with UTI showed increased risk of having anemia during the second trimester 14.9 times than others, because preferential expansion of plasma volume compared with red cell volume

causes progressive haemodilution up to about 30th -3511 weeks , that may reduce the Hb concentration to 11 g/dl and lower values can't be accounted for by physiological changes alone and in practice oi' lib concentration of 10 g/dl is diagnosed as pregnancy anemia and the associated morbidity (infections) should be investigated for [15].

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