

The structure of the incidence of renal diseases in pregnant woman in Baku

Shayman Hasanali Kadimova

Department of Obstetrics and Gynecology II Azerbaijan Medical University, Bakikhanov str., 23, Baku, AZ 1003, Azerbaijan

Abstract. On studying the structure and dynamics of kidney disease in pregnant women we found that the leading pathologies were presented by chronic pyelonephritis (27.2%), hydronephrosis kidney (14.8%) and eclampsia (12.0%). The prevalence of cystitis was 4.8%, kidney stone disease occurred in 3.2% of cases, renal colic - 2.4%, renal abnormalities - 0.8%. Leading risk factors for the development of renal disease in pregnant women were the following: burden family history for nephrological pathology (48.0%), moderately severe pre-eclampsia (42.0%), bacterial and viral infections in anamnesis (38.0%), anemia (32.0%), severe form of preeclampsia of pregnancy (28.0%), diseases of cardiovascular system (14.8%). The conducted studies indicate social genesis of renal diseases among pregnant women and the role of a number of socio-epidemiological prerequisites in their prevalence among pregnant women in Baku. Elimination of the revealed socio-epidemiological prerequisites opens up broad prospects in the organization and implementation of rational prevention of renal disease in pregnant women.

[Kadimova S.H. **The structure of the incidence of renal diseases in pregnant woman in Baku.** *Life Sci J* 2014;11(12s):915-919] (ISSN:1097-8135). <http://www.lifesciencesite.com>. 199

Keywords: placentary insufficiency, nephritic pathology, pregnancy

Introduction

Today the pathology of genitourinary system refers to one of the most important problems of medical science and practice. It has a leading position in the structure of morbidity of pregnant women [1, 2, 3, 4]. Outcome of many kidney diseases is chronic renal failure is the most tragic pathological condition. Social significance of chronic diseases of the genitourinary system and kidney disease, in particular, determine the large economic costs due to disability, considerable cost of treatment and rehabilitation of patients [5, 6, 7, 8, 9].

In order to develop an evidence-based set of measures to reduce losses in the health status of pregnant women from kidney disease and its complications, it is necessary to study epidemiological aspects and to improve algorithm of early diagnosis and management of pregnant women [10, 11, 12]. Unfortunately no coherent system was developed for prevention of renal disease among pregnant women in Baku. Doctors can't limit the spread of these diseases using only curative measures without such prevention system. In this regard, the goal of our study was predetermined by a number of important issues in epidemiological prevention of renal disease among pregnant women.

Objective of the study: development of a comprehensive system for the prevention of renal disease in pregnant women based on the study of epidemiological aspects of this disease.

Materials and methods

In this paper for the purpose of the study on the basis of clinical and laboratory criteria in the

period from 2009 to 2011 we examined 250 pregnant women aged from 17 to 39 years (the mean age - 27.98 ± 5.3) with renal pathology. All the studied women were at 16-40 weeks of pregnancy, and were observed at the Department of Obstetrics and Gynecology of the 2nd Azerbaijan Medical University and Sh. Aleskerova Maternity Hospital No. 5. Medical examination of all women was performed in the terms of 16-22, 23-29, 30-36 and 37-40 weeks of pregnancy.

We used the methods of retrospective epidemiological analysis of the prevalence of renal disease in pregnant women of Baku. Prevalence and incidence of renal disease in pregnant women depending on nosological form was studied during the analysis of medical case histories over a three-year period. It included the analysis of the clinical characteristics, peculiarities of pregnancy course, childbirth, postpartum, status of fetus and newborn in 250 women. These women comprised the main group (group I) of patients with renal impairment; additionally we enrolled 80 pregnant patients aged from 18 to 34 years (mean age 24.57 ± 0.7) without renal pathology and clinical manifestations in history as a control group (group II).

Evaluation of the functional state of the mother-placenta-fetus system was performed using ultrasound, Doppler studies and cardiotocography. Ultrasound and Doppler studies were performed using the equipment "Aloka SSD -2000" (Japan). For cardiotocography we used an automated antenatal monitor (AAM-04) manufactured by "Unikos" (Russia). Statistical evaluation of the study results was performed using Microsoft Excel 2007. In

comparative evaluation of two values we calculated the validity criterion for Student evaluations. Differences were significant at $p < 0.05$.

Results and discussion

All the studied patients were observed prospectively. Herewith from the 1st trimester we observed 45.8% of pregnant women; from the 2nd trimester we observed 33.3% and from the 3rd trimester - 20.9%. The age of pregnant women at groups I and II ranged from 17 to 39 years old. In the average it was equal to 27.98 ± 5.3 years in group I, and 24.5 ± 3.7 years in group II. Age characteristics of the patients are presented in Table 1.

Table 1. Age characteristics of pregnant women

Age (years) Groups	≤ 18		20 - 29		≥ 30	
	N	%	n	%	n	%
Group I (n = 250)	15	6.0±1.9	160	64.0±3.9	75	30.0±3.7
Group II (n = 80)	2	4.0±1.6	29	58.0±6.9	19	38.0±6.7

It turned out that the largest group of subjects consists of pregnant women in the age group of 20-29 years - group I - 160 women, representing $64.0 \pm 3.9\%$ of all subjects, while group II included 29 pregnant women - $58.0 \pm 6.9\%$. First and repeated births in the group of 30 years and older (group I - 75 subjects, and group II - 19 subjects) occur respectively in $30.0 \pm 3.7\%$ and $38.0 \pm 6.7\%$ of cases. Pregnancy at the age below 18 years was observed in 15 ($6.0 \pm 1.9\%$) and 2 ($4.0 \pm 1.6\%$) cases, respectively, in the groups I and II ($p > 0.05$).

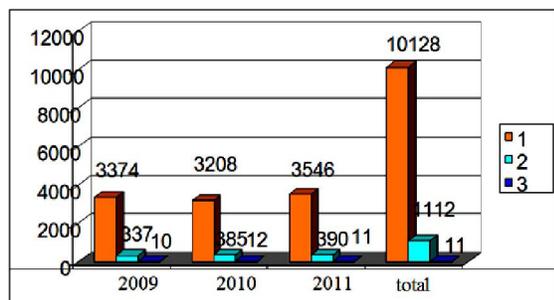


Figure 1. The number of primary renal disease cases in pregnant women in Baku (2009-2011 years). Legend: 1 - total surveyed pregnant women, 2 - pregnant women with renal disease, abs. 3 - in %

As a result, epidemiological analysis found that during the observation period from 2009 to 2011 the prevalence of renal disease in pregnant women in Baku was equal to 11.0% (Fig. 1). If in 2009 the total

prevalence of renal diseases in pregnant women in Baku was equal to 337 (10.0%) cases, in 2010 there were 385 (12.0%) cases of renal diseases in pregnant women in Baku. In 2011 the number of registered cases of renal diseases in pregnant women increased compared to 2009 and was equal to 390 (11.0%) subjects.

Analysis of the structure and dynamics of registered abnormalities of urinary tract in pregnant women during 2009-2011 years in Baku revealed the prevalence of chronic pyelonephritis (22.7%) compared to renal hydronephrosis (14.8%) and preeclampsia (12.0%). The prevalence of cystitis was 4.8%, kidney stone disease occurred in 3.2% of cases, renal colic - 2.4%, renal abnormalities - 0.8% (Table 2).

Table 2. Registered renal pathology in the surveyed pregnant women in Baku in the period from 2009 to 2011 years

Nosologies	abs.	%
acute pyelonephritis	16	6.4
gestational pyelonephritis	18	7.2
Eclampsia	30	12.0
Cystitis	12	4.8
Urolithiasis	8	3.2
renal colic	6	2.4
renal abnormalities	2	0.8
chronic pyelonephritis	68	27.2
renal hydronephrosis	37	14.8
chronic glomerulonephritis	24	9.6
asymptomatic bacteriuria	16	6.4
tubulointerstitial nephritis	13	5.2

During the study period there was an increase in the proportion of chronic pyelonephritis in the structure of registered chronic kidney disease in pregnant women aged from 17 to 39 years and amounted to $27.2 \pm 0.8\%$ (Fig. 2).

In the overall structure of chronic kidney diseases renal hydronephrosis was on the 2nd leading place with $14.8 \pm 0.6\%$, eclampsia was on the third place - $12.0 \pm 0.5\%$. The incidence of urolithiasis was 3.2%, cystitis occurred in 4.8%, chronic glomerulonephritis - 9.6% ($p < 0.05$). We didn't reveal any statistically significant differences on analyzing the incidence of asymptomatic bacteriuria and tubulointerstitial nephritis (6.4% and 5.2%).

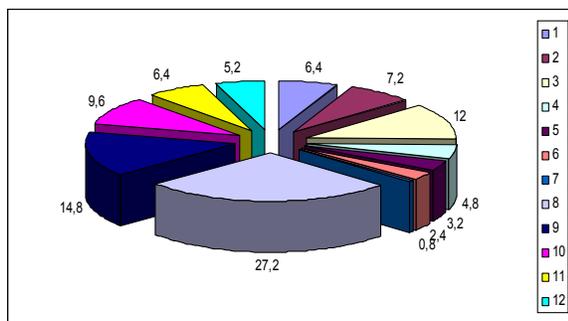


Figure 2. Structure of the incidence of renal diseases in pregnant women in Baku in the period from 2009 to 2011. Legend: 1- acute pyelonephritis; 2 - gestational pyelonephritis; 3 - eclampsia; 4 - cystitis; 5 - urolithiasis; 6 - renal colic; 7 - anomalies of the kidneys; 8 - chronic pyelonephritis; 9 – renal hydronephrosis; 10 - chronic glomerulonephritis; 11 - asymptomatic bacteriuria; 12 - tubulointerstitial nephritis

The highest incidence of chronic disorders of the urinary system in the age structure of pregnant women occurred in subjects from 20 to 29 years ($64.0 \pm 3.9\%$) and in pregnant women older than 30 years ($30.0 \pm 3.7\%$). The lowest proportion of the incidence of renal disease was revealed in pregnant women ≤ 18 years ($6.0 \pm 1.9\%$).

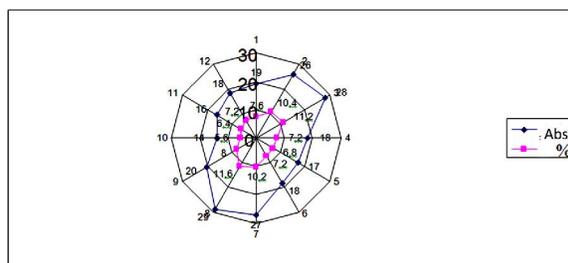


Figure 3. Intraannual dynamics of the seasonal incidence of renal disease in pregnant women in Baku for the period from 2009 to 2011 years (%).

Determination of seasonality of infectious diseases is important in epidemiological terms, as it allows to perform target preventive measures. In the evidence-based data it was found that in winter there is a decrease in the immunological status and the body becomes more susceptible to catarrhal and inflammatory diseases, including kidney diseases. Based on the data on the monthly incidence of renal disease in pregnant women in Baku in the period from 2009 to 2011 years we analyzed the distribution

of the incidence of renal disease in pregnant women for three years. Intra-annual curve of renal disease dynamics in pregnant women allowed to distinct two periods of the seasonal morbidity, which were recorded in the month of February and July (Fig. 3).

Study of the incidence of chronic pyelonephritis allows to distinct clearly that the peak of incidence occurred in February, March, July and August (Fig. 4.).

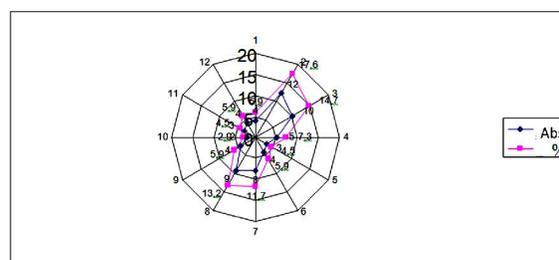


Figure 4. Annual dynamics of seasonal morbidity of chronic pyelonephritis in pregnant women in Baku for the period from 2009 to 2011 years (%).

Questioning revealed some epidemiological evidence that can explain the patterns of distribution of renal disease among pregnant women in Baku. Therefore, on the basis of comprehensive analysis of the survey data, we thought it was important to determine to what extent the complex of social factors inherent to 250 of the observed pregnant women with renal pathology affects the prevalence of renal diseases. Although the number of pregnant women in the control group wasn't too high (80 women), we likely to assume that it quite closely reflects the current socio-sexual women's status (Table 3). We also want to note the dependence of renal disease associated with socio-hygienic factors on the health of the mother, course of pregnancy and childbirth, family history, viral and bacterial infections.

Table 3. Risk factors for the development of renal diseases in pregnancy, Baku

Sign	Group I (n = 250)		Group II (n = 80)		p
	Abs.	%	Abs.	%	
Family history of the renal pathology	120	48.0±3.2	7	8.8±3.1	p<0.001
Severe pre-eclampsia	70	28.0±2.8	2	2.5	p<0.001
Anemia in pregnancy	80	32.0±2.9	9	11.3±3.5	p<0.05
Moderately severe pre-eclampsia	105	42.0±3.1	14	17.5±4.2	p<0.05
Viral and bacterial infections in past	95	38.0±3.1	13	16.8±4.2	p<0.05
Hypothermia of pregnant women	57	22.0±2.6	8	10.0±3.3	p<0.05
Diseases of the cardiovascular system	37	14.8±2.3	5	6.2	p<0.05
Diseases of the gastrointestinal tract	20	8.0±0.7	2	2.5	p<0.05
Non-compliance with diet	35	14.0±2.1	7	8.8±3.1	p<0.05
Effect of stress factors	30	12.0±2.0	7	8.8±3.1	p<0.05
Poor living conditions	89	35.6±3.0	22	27.5±3.0	p<0.05
Intake of protein foods	30	12.0±3.0	5	6.2	p<0.05
Drinking large amounts of salt	35	14.0±2.1	6	7.5±2.9	p<0.05

As it can be seen the main risk factors for renal disease development in pregnant women in Baku city were the following: family history of nephrology pathology which was observed in 48.0% of pregnant women of the group I. In group II subjects family history of kidney disease was significantly lower and was equal to 8.8% ($p < 0.001$). The burden heredity for cardiovascular system pathology occurred in 14.8% of pregnant women with kidney disease and compared with group II (6.2%). The following conditions were recorded during the pregnancy: severe form of preeclampsia (28.0% in group I, 2.5% in group II, $p < 0.001$); moderately severe pre-eclampsia (42.0% in group I, 17.5% in group II, $p < 0.05$); anemia (32.0% in group I, 11.3% in group II, $p < 0.05$). The presence of pregnant women suffering from kidney disease of concomitant diseases of the cardiovascular system was detected in 14.8% cases (group II - 6.2%, $p < 0.05$).

It was quite clear that the financial condition can't exert a direct influence on the formation of renal disease among pregnant women. Its impact is mediated through a number of known factors. Among them are the following. Poor financial condition in the family leads to the impoverishment of the diet, calorie intake is inadequate, it is poor in vitamins and minerals and the main structural components necessary for the development of the immune system (Table 4).

Table 4. Evaluation of relevant socio-epidemiological factors in the prevalence of renal disease among pregnant women

Factors	Group I (N = 250)		Group II (N = 80)		Reliability differences	
	abs.	%	abs.	%	T	P
Income:						
-Not prosperous	71	28.4±2.8	15	18.7±4.3	4.29	<0.001
-Relatively prosperous	79	31.6±2.9	27	33.7±5.2	0.76	>0.05
-Prosperous	42	16.8±2.4	22	27.5±4.9	4.74	<0.001
-Not specified	57	22.8±2.7	15	18.7±4.4	1.50	>0.05
Living conditions:						
- Not satisfactory	89	35.6±3.0	22	27.5±3.0	3.02	<0.01
-Satisfactory	96	38.4±3.0	28	35.0±5.3	1.30	>0.05
-Favorable	35	14.0±2.2	17	21.2±4.5	3.46	<0.001
-Not specified	28	11.2±1.9	12	15.0±3.9	2.10	<0.05

In such families there is a high level of psycho-emotional stress, which can also stimulate the development of renal disease among pregnant women in Baku. Apparently, the above-noted is the reason that the rate of poor financial condition is more common in women with renal diseases than in women without renal disease - 28.4 ± 2.8 and 18.7 ± 4.3% ($t = 4.29$; $p < 0.001$) respectively. Whereas the number of successful financial position is below

among the first women and higher among the second women - 16.8 ± 2.4 and 27.5 ± 4.9% ($t = 4.74$; $p < 0.001$) respectively.

Conclusion

Analyzing the structure and dynamics of kidney disease in pregnant women in the period of 2009-2011 in Baku we found that the leading positions were: chronic pyelonephritis (27.2%), renal hydronephrosis (14.8%) and eclampsia (12.0%). The prevalence of cystitis was 4.8%, kidney stone disease occurred in 3.2% of cases, renal colic - in 2.4%, and renal abnormalities - in 0.8% of cases. The leading risk factors for the development of renal disease in pregnant women of Baku were: family history of renal pathology (48.0%), moderately severe pre-eclampsia (42.0%), bacterial and viral infections in anamnesis (38.0%), poor living conditions (35.6%), anemia (32.0 %), severe form of preeclampsia of pregnancy (28.0%), and diseases of cardiovascular system (14.8%).

Poor financial state of families usually coincides with their poor living conditions. Therefore, these two factors have a negative complex impact on the components of health. Not coincidentally, pregnant women with renal disease are often revealed in families with poor living conditions than pregnant women from the control group: 35.6 ± 3.0 and 27.3 ± 5.0% ($t = 3.02$; $p < 0.01$). On the contrary their number is less compared to the second ones - in families with favorable living conditions - 14.0 ± 2.2 and 21.2 ± 4.5% ($t = 3.46$; $p < 0.001$).

Thus, the results of the research have established epidemiological characteristic of renal disease in pregnant women (incidence, structure, dynamics) in Baku in the period from 2009 to 2011. The performed studies indicate social confines of renal disease among pregnant women and the role of a number of socio-epidemiological prerequisites in their prevalence among pregnant women in Baku. As it can be seen the elimination of the identified socio-epidemiological prerequisites opens up broad prospects in the organization and conduction of rational prevention of renal disease in pregnant women.

Corresponding Author:

Dr. Kadimova Shayman Hasanali
Department of Obstetrics and Gynecology II
Azerbaijan Medical University
Bakikhanov str., 23, Baku, AZ 1003, Azerbaijan

References

1. Batyushin, M.M., V.P. Terent'ev, O.V. Dmitrieva and P.E. Povilyati, 2009. Chronic

- kidney disease. The role of nonsteroidal anti-inflammatory drugs. St. Petersburg: Dzhangar, pp: 136.
2. Epstein, F.H., 2009. Pregnancy and renal disease. *The New England Journal of Medicine*, Vol. 335, 8: 277-278.
 3. Kitaeva, Y.Y., 2011. Epidemiology and prevention of chronic kidney disease in children and adolescents, abstract from thesis of Candidate of Medical Sciences, State Medical Academy of Omsk, Omsk, pp: 24.
 4. Maximova, A.S., 2007. Kidney disease. St. Petersburg: Phoenix, pp: 256.
 5. Rogov, V.A. and N.B. Gordovskaya, 2009. Kidney and pregnancy. In the book: *Nephrology under the supervision of I.E. Tareeva*. Moscow: Medicine, pp: 464-484.
 6. Gyselaers, W., T. Mesens, K. Tomsin, G. Molenberghs and L. Peeters, 2010. Maternal renal interlobar vein impedance index is higher in early-than in late-onset pre-eclampsia. *Ultrasound in Obstetrics and Gynecology*, 36(1): 69-75.
 7. Moulin, B., A. Hertig and E. Rondeau, 2010. Kidney and preeclampsia. *Annales Francaises D Anesthesie Et De Reanimation*, 29(4): 83-90.
 8. Bdolah, Y., S.A. Karumanchi and B.P. Sachs, 2005. Recent advances in understanding of preeclampsia. Review *Croatian Medical Journal*, pp: 728-736.
 9. Spaan, J.J., T. Ekhart, M.E. Spaanderman and L.L. Peeters, 2010. Reduced renal function after preeclampsia does not result from accelerated age-dependent renal function loss. *Acta Obstetricia et Gynecologica Scandinavica*, 89(9): 1202-5.
 10. Yuan, L., Y. Duan and T. Cao, 2007. Hemodynamic changes of main renal arteries in pregnancy-induced hypertension. *European Journal Obstetrics Gynecology & Reproductive Biology*, 131(1): 36-9.
 11. Enkin, M.T., 2003. Guide on effective care in pregnancy and child birth. St. Petersburg: ID "Petropolis", pp: 240.
 12. Imbasciati, E. and C. Ponticelli, 2007. Pregnancy and renal disease: predictors for fetal and maternal outcome. *American Journal of Nephrology*, 11: 353-362.

8/19/2014