

ORIGINAL ARTICLE

Urinary Tract Infections - A Real Matter of Concern Regarding Preterm Delivery in Pregnant Females

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ABSTRACT

Objective: To find out prevasiveness of urinary tract infections in pregnant females who undergo premature deliveries.

Design: Cross sectional study

Setting: The study was conducted in Obstetrics and Gynaecology Deptt. Nishtar Hospital Multan.

Duration of study: Six months (01-12-2017 to 01-05-2018).

Subjects and Methods: Patients fulfilling the inclusion criteria and who underwent preterm deliveries in labour room, unit 1 were included in the research. 357 pregnant women who delivered prematurely were included in our research. Midstream urine samples were collected in sterilized bottles and was immediately shifted to pathology laboratory for culture and sensitivity.

Results: Gestational Age Mean of patients noted to be 29.98 ± 2.29 weeks and 219 (61.3%) were 30 wks pregnant. Mean age of pregnant females was 27.47 ± 3.97 years (varied b/w 20 – 37 yrs). Out of 357 pregnant ladies, 97 (27.2 %) were from villages and 260 (72.8 %) lived in cities. Earning per month, up to 30000 Rs. was noted in 206 (57.7%) while > 30000 Rs. Observed in 151 (42.3%). Mean BMI noted was 25.9 ± 1.38 kg/m² and 109 (30.5 %) were obese. Out of 357 pregnant females, urinary tract infection was found in 137 (38.3%) patients undergoing preterm labor.

Conclusion: Urinary tract infection (UTI) was commonly found among women undergoing preterm labor. Urinary tract infection had significant association with GA, age, residence, monthly earning, obesity, parity & literacy. Clinicians treating such patients undergoing preterm labor should always be vigilant for these infections as early detection and prompt treatment will decrease disease related morbidity and improve perinatal outcomes.

Keywords : Urinary Tract Infection, Preterm labor, Frequency.

INTRODUCTION

Preterm births are the births before 37 weeks of gestation. Approximately 15million babies are born at preterm gestation per year and 11million of these preterm births were in underdeveloped countries¹. Preterm births constitute the leading cause of neonatal mortality and the mortality under 5years of age^{2,3}. Preterm babies (25 -30%) have disability of nervous system, difficulties in coping, learning and behavior at school, problems with hearing / vision and achievement of developmental milestones.⁴

Genitourinary infections affect 41% women of reproductive age group and lead to adverse perinatal outcomes including miscarriage, preterm births, still births, intrauterine growth restrictions (IUGR), infections in neonate and mother, neonatal encephalopathy, demise of mother & neonate⁵. UTI is common in antenatal period & causes premature onset of labour. The causative agents are G-negative bacteria which because of systemic inflammatory response and release of interleukins&TNF leads to premature delivery. Asymptomatic bacteriuria occurrence in antenatal period varies b/w 6.9 % to 87 %^{6,7}. There is a high risk of progression of asymptomatic bacteremia to pyelonephritis, preeclampsia, preterm birth and low birth weight babies⁸. Incidence of UTI in pregnancy in Pakistan is 28.5%^{9, 10, 11}. Prevalence of UTI in pregnancy is 22-35%^{12,13, 14}.

In a study conducted by Paulo Cesar Giraldo and associates in Brazil showed that the prevalence of urinary tract infections in preterm pregnancies was 36.7%¹⁵.

There is paucity of related data available in South Punjab Pakistan so there was a need to conduct a study to find out the frequency of urinary tract infections in those women with preterm birth so that urinary tract infections be effectively treated to reduce the frequency of preterm births and the resultant morbidities associated with preterm births.

MATERIAL & METHODS

Design: Cross sectional study

Setting: This research was conducted in Obs & Gynae Deptt. in Nishtar Hospital, Multan.

Duration: 6 months.

Size of Sample: For calculation, the formula applied was:

$$n = \frac{Z^2 pq}{d^2}$$

n=357, p=36.7%¹⁵, d=5%

Sampling technique: Non probability consecutive sampling.

Inclusion Criteria:

- All pregnant females (b/w 20 to 45 years of age) undergoing labour before 37 weeks of gestation.

Exclusion Criteria:

- Smoking.
- Hypertension.
- Diabetes.
- Pelvic inflammatory disease.
- Uterine and cervical abnormalities.
- Factors in current pregnancy including recurrent antepartum hemorrhage, inter-current illness, any invasive procedure.

Data collection Procedure: All pregnant females who met the set standards and gave birth to preterm births in unit 1, labour room were recruited and permission taken from ethical department. Sociodemographic data such as age, parity, weight, previous history, income, occupation, education, residential address, personal hygiene, past history of UTI, urinary tract infection. Midstream urine samples were collected in sterilized bottles and was immediately sent to pathology lab for culture and sensitivity. Data was collected on especially designed proforma.

Data Analysis: Data collected through this study was computerized and analyzed using statistical analyzing program SPSS. SD & Mean was calculated for patients age and gestational age. Percentages/ Frequency were calculated for age groups, residential status, monthly family income, urinary tract infection.

Effect modifiers like age, GA, residence, earning in a month and education status were stratified. After then, chi – square test was applied. P value = or < 0.05 was taken significant.

RESULTS

Among 357 patients, Mean GA was 29.98 ± 2.29 weeks and 219 (61.3%) had GA upto thirty wks. (Table No. 1).

Mean of patients ages was 27.47 ± 3.97 years (range b/w 20 - 37 yrs). Most of the patients i.e. 316 (88.5 %) were 30 yrs of age. (Table No. 1).

Out of 357 females, 97 (27.2 %) came from villages and 260 (72.8 %) were from cities. Earning / month of a family was Rs. 30000 in 206 (57.7%) & 151 (42.3%) earned >30,000 Rs / month . (Table No. 1).

Mean BMI was $26.16 \pm 1.38 \text{ kg/m}^2$ and 109 (30.5 %) patients were obese . (Table No. 1).

Among 357 pregnant females, 191 (53.5%) were illiterate while 166 (46.5%) were literate. (Table No. 1). Mean parity noted was 2.72 ± 1.16 & 288 (80.7%) were Para 3. (Table No. 1).

Of these 357 study cases, urinary tract infection was noted in 137 (38.4%) patients undergoing preterm labor. (Table No. 1).

Urinary Tract Infection was stratified with regards to gestational age, Age, residence, earning /month, obesity, education status and parity. (Tables 2-8)

Table 1: Distribution of Patients According To Gestational Age, Age, Residential Status, Literacy, Obesity, Parity, and UTI (n = 357)

| Variable | | Number | % age |
|--------------------------|-------------|--------|-------|
| Gestational Age | Up to 30 wk | 219 | 61.3 |
| | >30 wk | 138 | 38.7 |
| Age | Up to 30y | 316 | 88.5 |
| | >30y | 41 | 11.5 |
| Residential Status | Rural | 97 | 27.2 |
| | Urban | 260 | 72.8 |
| Distribution of literacy | Illiteracy | 191 | 53.5 |
| | Literacy | 166 | 46.5 |
| Distribution of obesity | Obese | 109 | 30.5 |
| | Non Obese | 248 | 69.5 |
| Parity | 0 – 3 | 288 | 80.7 |
| | >3 | 69 | 19.3 |
| UTI | Yes | 137 | 38.4 |
| | No | 220 | 61.6 |

Table 2: Stratification of urinary tract infection acc to GA. (357)

| Gestational age | Urinary Tract Infection | | P – value |
|----------------------------|-------------------------|----------|-----------|
| | Yes (137) | No (220) | |
| Up to 30 weeks (n=219) | 123 | 96 | 0.00 |
| More than 30 weeks (n=138) | 14 | 124 | |
| total | 357 | | |

Table 3: Stratification of Urinary Tract Infection acc to Age. (n = 357)

| Age | Urinary Tract Infection | | P – value |
|-------------------|-------------------------|------------|-----------|
| | Yes (n=137) | No (n=220) | |
| Upto 30 Yrs (316) | 96 | 220 | 0.000 |
| > 30 Yrs (41) | 41 | 00 | |
| Total | 357 | | |

Table 4: Stratification of Urinary Tract Infection acc to residence. (n = 357)

| Residence | Urinary Tract Infection | | P – value |
|---------------|-------------------------|----------|-----------|
| | Yes (137) | No (220) | |
| Rural (n=97) | 55 | 42 | 0.000 |
| Urban (n=260) | 82 | 178 | |
| Total | 357 | | |

Table 5: Stratification of Urinary Tract Infection acc to earning of family / month. (n = 357)

| Monthly Family earning | Urinary Tract Infection | | P – value |
|------------------------|-------------------------|------------|-----------|
| | Yes (137) | No (n=220) | |
| Yes (206) | 67 | 139 | 0.008 |
| No (151) | 70 | 81 | |
| Total | 357 | | |

Table 6: Stratification of Urinary Tract Infection with regards to obesity. (n = 357)

| Obesity | Urinary Tract Infection | | P – value |
|-----------|-------------------------|------------|-----------|
| | Yes (n=137) | No (n=220) | |
| Yes (109) | 26 | 83 | 0.000 |
| No (248) | 111 | 137 | |
| Total | 357 | | |

Table 7: Stratification of Urinary Tract Infection acc to Education status. (n = 357)

| Education status | Urinary Tract Infection | | P – value |
|--------------------|-------------------------|----------|-----------|
| | Yes (137) | No (220) | |
| Illiterate (n=191) | 95 | 96 | 0.000 |
| Literate (n=166) | 42 | 124 | |
| Total | 357 | | |

Table 8: Stratification of Urinary Tract Infection with regards to parity. (n = 357)

| Parity | Urinary Tract Infection | | P – value |
|--------------------|-------------------------|------------|-----------|
| | Yes (n=137) | No (n=220) | |
| Up to 3 (n=288) | 68 | 220 | 0.000 |
| More than 3 (n=69) | 69 | 00 | |
| Total | 357 | | |

DISCUSSION

A preterm birth is when a baby is born before 37 wks of pregnancy are completed. The major concern regarding a baby delivering prematurely is due to associated ailments and early neonatal death. Globally, approximately >1 out of 10 babies are born premature . It effects 14.5 to 15.5 million babies per annum. In developed world, it occurs in 8.6% of births while 7% to 14% in developing countries.

Majority of neonates born prematurely in developed countries with advanced neonatal facilities, survive , almost > 90% with no evidence of physical or neurological disability. On the other hand, the percentage of surviving neonates born too early in developing countries , is too small (25-31%)¹⁶.

Both the short & long term financial burden required for care of a premature fetus ,pose a great challenge for the family. Since the available evidence is suggestive that infection plays an important role in initiating premature uterine contractions, so early detection and prompt treatment decreases the magnitude of this condition.

Our research included 357 such patients who underwent preterm deliveries. Mean GA of recruited population was 30.48 ± 3.29 weeks and 219 (61.3%) had gestational age up to 30 wks. Thorp et al⁹⁵ and Bodnar et al¹⁷ research work concluded almost similarly.

Mean age of pregnant females , noted was 26.47 ± 3.97 years (varied b/w 20 & 37 years). Most of the patients were 30 years old . In Thorp study,¹⁹ Mean of patient's age was 26.8 ± 5.5 years correspond closely to present research work. Pratumvinit et al¹⁹ noted 29 ± 5.3 as Mean of females ages. Bodnar et al¹⁷ study concluded the same.

Among 357 females, 97 (27.2 %) came from villages & 260 (72.8 %) from cities. Earning per month was Rs. 30000 in 206 (57.7%) of pregnant females while > Rs. 30000 in 151 (42.4%). Mean BMI was $26.16 \pm 1.38 \text{ kg/m}^2$ and 109 (30.5 %) were found obese . Enaruna et al²⁰ reported 25.3% obesity which is in compliance with our study results. Enaruna²⁰ reported 70 % of the women undergoing preterm labor from poor social classes, similar to our research work.

Out of 357 pregnant females, urinary tract infection was noted in 137 (38.4%) patients undergoing preterm labor. In a study conducted by Paulo Cesar Giraldo and associates¹⁵ in Brazil showed that the prevalence of urinary tract infections in preterm pregnancies was 36.7%.

CONCLUSION

Urinary tract infection was found commonly in women undergoing preterm labor. The association b/w UTI and other parameters like GA, age, residence, Earning /month, obesity, parity and literacy, was found to be significant. Clinicians treating such patients undergoing preterm labor should always them for these infections which will decrease disease related morbidity and improve perinatal outcomes.

REFERENCES

1. Blencowe H, Cousens S, Oestergaard MZ, Chou D, Moller AB, Narwal R, et al. National, regional, and worldwide estimates of preterm birth rates in theyear 2010 with time trends since 1990 for selected countries: a systematicanalysis and implications. *Lancet*. 2012;379:2162–72.
2. Liu L, Johnson HL, Cousens S, Perin J, Scott S, Lawn JE, et al. Global, regional, and national causes of child mortality: an updated systematic analysis for 2010 with time trends since 2000. *Lancet*. 2012;379:2151–61.
3. Liu L, Oza S, Hogan D, Perin J, Rudan I, Lawn JE, et al. Global, regional, andnational causes of child mortality in 2000–13, with projections to inform post-2015 priorities: an updated systematic analysis. *Lancet*. 2015;385:430–40.
4. Saigal S, Doyle LW. An overview of mortality and sequelae of preterm birthfrom infancy to adulthood. *Lancet*. 2008;371:261–9.
5. Newton ER. Preterm labor, preterm premature rupture of membranes, andchorioamnionitis. *ClinPerinatol*. 2005;32:571–600.
6. Stanton C, Lawn JE, Rahman H, Wilczynska-Ketende K, Hill K. Stillbirth rates:delivering estimates in 190 countries. *Lancet*. 2006;367:1487–94.
7. Nelson KB, Willoughby RE. Infection, inflammation and the risk of cerebralpalsy. *CurrOpin Neurol*. 2000;13:133–9.
8. Bolton M, Horvath DJ, Li BI. Intrauterine growth restriction is a direct consequence of localized maternal uropathogenic *Escherichia coli* cystitis. *Plos One*. 2012;7:1-9.
9. Gebre-Selassie S. Asymptomatic bacteriuria in pregnancy: epidemiological, clinical and microbiological approach. *Ethiop Med J*. 1998;36:185–92.
10. Akerlele J, Abhulimen P, Okonofua F. Prevalence of asymptomatic bacteriuriaamong pregnant women in Benin City, Nigeria. *J ObstetGynaecol*.2001;21:141–4.
11. Sheikh MA, Khan MS, Arian GM.. Incidence of urinary tract infection during pregnancy. *EastMediter Health J*. 2000;6 (2/3):265-71.
12. Agina MFH. Urinary Infections Amongst the Adult Female out patientsattendants at the Banha University Hospital with special reference topregnancy. Thesis, M.Sc, Medical microbiology. Zagazig: Banha branch,gazig University Faculty of Medicine, Egypt, 1985.
13. MaqladAF.. Urinary Tract Infection Associated with pregnancy. Thesis,M.Sc, Medical microbiology. Shebein El-Koum: Menoufia University,Faculty of Medicine, Egypt 1992
14. Badr AFK. Bacteruria in Egyptian Pregnant Women: A clinical and bacteriological study. Thesis, M.Sc, urology. Cairo: Al-Azhar University, Faculty of Medicine, Egypt, 1992.
15. Giraldo PC, Araujo ED, Junio JE, do Amaral RL, Passos MR, Goncalves AK. The prevalence of urogenital infections in pregnant women experiencing preterm and full term labor. *Infect Dis Obstet Gynecol*. 2012;2012:878241.
16. Flenady V, Reinebrant HE, Liley HG, Tambimuttu EG, Papatsonis DN. Oxytocin receptor antagonists for inhibiting preterm labour. *Cochrane Database Syst Rev*. 2014 Jun 6;(6):CD004452.
17. Thorp JM, Camargo CA, McGee PL, Harper M, Klebanoff MA, Sorokin Y, et al. Vitamin D status and recurrent preterm birth: a nested case-control study in high-risk women. *BJOG* 2012;119(13):1617–23.
18. Pratumvinit B, Wongkrajang P, Wataganara T, Hanyongyuth S, Nimmannit A, Chatsiricharoenkul S, et al. Maternal Vitamin D Status and Its Related Factors in Pregnant Women in Bangkok, Thailand. *PLoS One*. 2015 Jul 6;10(7):e0131126.
19. Bodnar LM, Platt RW, Simhan HN. Early-pregnancy vitamin D deficiency and risk of preterm birth subtypes. *Obstet Gynecol*. 2015;125(2):439-47.
20. Enaruna NO, Ande A, Okpere EE. Clinical significance of low serum magnesium in pregnant women attending the University of Benin Teaching Hospital. *Niger J ClinPract*. 2013;16(4):448-53