

Short Communication

Risk Factors and Referral Rates for Urinary Tract Infection in Pregnant Mothers of Southwest Guatemala

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Urinary tract infections (UTIs) affect one in four women in low- and middle- income countries and are associated with adverse maternal and neonatal outcomes [1, 2]. In Latin America, the prevalence of UTI is estimated to be 23-31%, yet data in this region is sparse [3]. The objective of this analysis was to understand the prevalence, referral rates, and risk factors associated with UTIs in the Southwest Trifinio region of Guatemala.

This study is a secondary analysis of a prospective cohort enrolled in the Madres Sanas community prenatal nursing program in Southwest Guatemala from 2018 to 2020. Study approval was obtained from the Colorado Multiple Institutional Review Board. Women enrolled in the Madres Sanas program who provided at least one dipstick urine sample and had a documented birth were included in the cohort. The study's primary outcome was presence or absence of UTI as indicated by dipstick (leukocyte esterase count > 15, protein \geq 30 mg/dL, or a positive result for nitrites) at any point

during four antenatal visits. SAS software University Edition version 9.4 was used for analysis (SAS Institute Inc., Cary, North Carolina).

From 2018 to 2020, 344 pregnant women were included in this cohort. On average, the population was 24 years old and had 2 prior pregnancies. The majority of the population received some formal (primary or higher) education, were married, had a weekly income ≤ \$5 USD, and were not employed by the local agribusiness. Prevalence of UTI among the cohort was 12.8% with an incidence of 60.9 per 1,000 individuals. Rate of referral for positive UTI was 32.1%, and UTI accounted for the greatest number of referrals compared to all other reasons for referral. Rate of repeat positive dipstick was 15.9%, though it was unknown whether this was the result of reinfection or inadequate treatment. No

significant differences in bivariate analyses were observed between women with and without diagnosis of antepartum UTI (data not shown). Pregnant mothers with no formal education had a non-significant increased risk of UTI (aRR 1.8; 95% CI: 0.94, 3.32), and mothers working for the local agribusiness had an increased but non-significant risk of UTI (aRR: 2.4; 95% CI: 0.89, 6.18) in a generalized linear regression model (Table 1).

Based on our results, we conclude there is a need for prospective research on UTI in this population with confirmatory culture, and observation of treatment practices and pregnancy outcomes associated with UTI diagnosis.

	RR	95 CI	p-value	aRR	95 CI	p-value
Education Level						
No formal education	1.8	(0.9, 3.4)	0.07	1.8	(0.9, 3.3)	0.08
Some Education	-	-	-	-	-	-
Employed						
Yes	2.4	(0.9, 6.5)	0.08	2.3	(0.9, 6.2)	0.09
No	-	-	-	-	-	-

Table 1: Crude and adjusted risk ratios for education and employment at Banasa and risk of urinary tract infection.

Author Contributions

MM conceived of the analytic plan with feedback and input from all authors, with significant feedback from MSH and ML. CR and SBM managed and oversaw data collection. AJZ performed data management. AB was the acting medical director of the program. EA and SB established the data collection program. Analysis was performed by MM with feedback from MSH, and ML. MM wrote the manuscript with input and edits from all authors.

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Conflict of Interest

The authors have no relationships to disclose that may be deemed to influence the objectivity of this paper and its review. The authors report no commercial

associations, either directly or through immediate family, in areas such as expert testimony, consulting, honoraria, stock holdings, equity interest, ownership, patent-licensing situations or employment that might pose a conflict of interest to this analysis. Additionally, the authors have no conflicts such as personal relationships or academic competition to disclose. The findings presented in this paper represent the views of the named authors only, and not the views of their institutions or organizations.

Ethical Statement

The Colorado Multiple Institutional Review Board approved this de-identified secondary analysis of data prospectively collected as part of a quality improvement database (COMIRB # 15-0909).

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collection of the data analyzed in this work and all the women who participated in the study—their health, well-being, and successful pregnancy outcomes are the motivation for performing this work.

References

1. Lee AC, Mullany LC, Quaiyum M, et al. Effect of population-based antenatal screening and treatment of genitourinary tract infections on birth outcomes in Sylhet, Bangladesh (MIST): a cluster-randomised clinical trial. *Lancet Glob Health* 7 (2019): e148-e159.
2. Hooton TM, Gupta K. Urinary tract infections and asymptomatic bacteriuria in pregnancy (2021).
3. Medina M, Castillo-Pino E. An introduction to the epidemiology and burden of urinary tract infections. *Ther Adv Urol* 11 (2019): 1756287219832172.



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