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STUDY OF POSTPARTUM URINARY TRACT INFECTION BY MODE OF DELIVERY - A CROSS SECTIONAL OBSERVATIONAL STUDY.

Obstetrics & Gynaecology

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KEYWORDS

INTRODUCTION

Postpartum urinary tract infection (UTI) remains an important cause of maternal morbidity, particularly during the early puerperium when physiological changes-such as bladder hypotonia, ureteral dilatation, and urinary stasis-predispose women to infection[1]. Additional intrapartum factors, including perineal trauma, dehydration, and reduced bladder sensation after delivery, further increase susceptibility[2].Multiple studies have shown that the risk of postpartum UTI differs significantly between modes of delivery. Women undergoing cesarean section (LSCS) have a higher incidence of UTI compared to those having a vaginal delivery (VD) due to routine perioperative catheterisation, longer duration of catheter use, surgical manipulation, and postoperative urinary retention[3]. Vaginal delivery carries a lower risk, although perineal tears, episiotomy, and prolonged labour can still contribute to infection .Across global and Indian studies, Escherichia coli remains the most common organism isolated in postpartum UTI, accounting for nearly 70–80% of culture-positive cases, followed by Klebsiella pneumoniae, Proteus, and Enterococcus species . This distribution is consistent with the pattern observed in many tertiary hospitals.Appropriate antibiotic therapy is essential to prevent complications such as pyelonephritis and sepsis. Nitrofurantoin is widely used as a first-line agent in postpartum uncomplicated UTIs owing to its safety in breastfeeding and favourable resistance profile . Current recommendations emphasize tailoring therapy to local culture and sensitivity patterns due to rising antimicrobial resistance.Thus, evaluating the incidence of UTI among vaginal and LSCS deliveries, along with organism profile, symptoms, and antibiotic use, is crucial for guiding clinical practice and improving maternal outcomes.

MATERIALS AND METHODS

This study was conducted in the Department of OBG at Akash Institute of Medical Sciences and Research Centre on 200 postpartum mothers from January 2024 to August 2025. Among them, 100 delivered vaginally and 100 by LSCS. All women were assessed for postpartum urinary tract infection through symptoms, urine routine, and culture when indicated. Relevant obstetric details and catheterisation history were recorded. Data were analysed using SPSS version 25.

INCLUSION CRITERIA

1) Postpartum mothers admitted to the postnatal ward during the study period.
2) Women who delivered either vaginally or by LSCS.
3) Mothers within 7 days postpartum.
4) Women who provided informed consent for participation.
5) Singleton pregnancies.

EXCLUSION CRITERIA

1) Antenatal or intrapartum urinary tract infection.
2) Known renal or urinary tract abnormalities.
3) Chronic medical conditions affecting UTI risk (e.g., diabetes mellitus, immunosuppression).
4) Prolonged indwelling catheter use (>24 hours) for non-obstetric reasons.
5) Multiple gestation pregnancies.
6) Patients unwilling to participate.

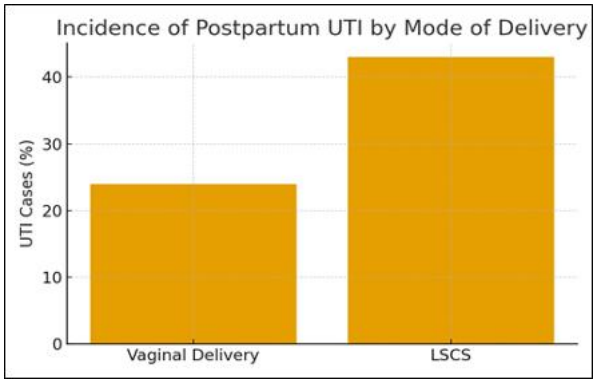
RESULTS

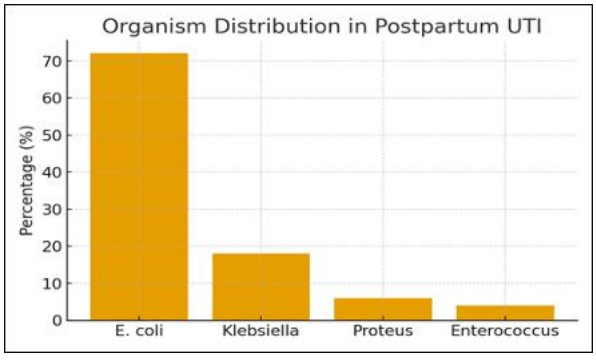
In our study, a total of 200 postpartum mothers were evaluated, out of which 100 had vaginal delivery and 100 underwent LSCS. The incidence of postpartum urinary tract infection was found to be higher among LSCS mothers. UTI occurred in 43% of LSCS cases, whereas only 24% of women who delivered vaginally developed UTI. This difference was statistically significant ($p < 0.001$).

Urine culture showed that E. coli was the most common organism isolated (72%), followed by Klebsiella pneumoniae (18%), Proteus species (6%), and Enterococcus species (4%). This pattern is consistent with typical postpartum UTI organism distribution.

Antibiotic sensitivity testing revealed that Nitrofurantoin had the highest sensitivity (84%), making it the most effective first-line agent in our population. Sensitivity to ciprofloxacin (61%) and cefixime (58%) was moderate, while amoxicillin-clavulanate showed lower sensitivity (42%).

Overall, our study demonstrates that postpartum UTI is significantly more common following LSCS than vaginal delivery, with catheterisation being an important contributing factor. E. coli remained the predominant pathogen, and nitrofurantoin showed the best sensitivity pattern among the antibiotics used.





DISCUSSION

In our study, postpartum urinary tract infection showed a higher incidence following cesarean section compared to vaginal delivery. Among the 200 postpartum women evaluated, 43% of LSCS cases developed UTI, whereas 24% of vaginal deliveries were affected. This difference was statistically significant, with Chi-Square test showing $p < 0.001$, indicating a strong association between mode of delivery and development of postpartum UTI. Similar findings were described by Schneid-Kofman et al[3],who reported that catheterisation and postoperative bladder dysfunction increase infection risk after cesarean section, which correlates with our results. Williams Obstetrics[2] also highlights that LSCS independently increases puerperal morbidity, supporting our observations.The most common organism isolated was E. coli, followed by Klebsiella pneumoniae and other standard uropathogens, consistent with global epidemiological trends[1] . E. coli remains the predominant pathogen due to its ability to

colonise the urinary tract efficiently. Our findings are in agreement with Gupta et al , who emphasized the predominance of Gram-negative bacilli in postpartum UTIs.In terms of symptoms, dysuria, frequency, urgency, and suprapubic discomfort were the most frequently reported, matching established postpartum UTI patterns described in earlier studies[1]. Nitrofurantoin was the primary antibiotic used in our hospital and showed good sensitivity in most cases, aligning with NICE recommendations that consider nitrofurantoin safe and effective in breastfeeding women.Although UTI incidence was lower following vaginal delivery, factors such as prolonged labour, perineal trauma, and postpartum bladder hypotonia may still contribute to infection . Overall, our study reinforces that mode of delivery significantly influences postpartum UTI risk, with LSCS posing a higher burden. Understanding organism distribution and adhering to culture-directed therapy are key to reducing postpartum infectious morbidity.

CONCLUSION

Postpartum urinary tract infection continues to be an important cause of maternal morbidity, and our study demonstrates that the risk is significantly higher following cesarean section compared to vaginal delivery. The higher incidence in LSCS mothers is largely attributed to catheterisation and postoperative bladder dysfunction. E. coli remained the most common pathogen, followed by Klebsiella, consistent with global trends. Nitrofurantoin was effective in most cases, supporting its role as a preferred first-line agent in breastfeeding women.Overall, recognising delivery-related risk factors, understanding organism patterns, and adopting culture-guided antibiotic therapy are essential to improve maternal outcomes and reduce the burden of postpartum UTI.

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