Abstract #426

Efficacy And Safety Of Single-Dose Intravesical Gentamicin Instillation For Treatment Of Recurrent Urinary Tract Infection

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Aim of Study

Recurrent urinary tract infection (UTI) is defined as repeated UTI with a frequency of at least two episodes in six months or three episodes in one year.[1] Acute UTI occurs in 50-80% of women in the general population. About one in four women with one UTI episode will go on to develop frequent recurrences, representing a substantial global healthcare problem.[1] Recurrent UTIs negatively impact patient's quality of life and cause a high burden on healthcare resources due to frequent antibiotic usage, increase multi-drug resistance microbes, and increased hospitalization for management of complicated cases of UTI.[1]

Intravesical antibiotics have been suggested as a safe and effective alternative to systemic antibiotic therapy. Intravesical gentamicin works locally with minimal systemic absorption and therefore less associated side effects. There have been several studies showing the effectiveness of intravesical gentamicin therapy in patients with recurrent UTI.[2,3] However, there is no consensus on the dosing regimen, frequency, or length of treatment.

This study aims to assess the safety and efficacy of a single dose of intravesical gentamicin installation for treatment of recurrent urinary tract infections. Furthermore, assessment of the side effect profile and pathogen pattern will be carried out. Finally, patient's epidemiological details will also be assessed.

Methods and Materials

Study Design: An observational case series was carried out at our specialized urogynaecology department from 1 January 2021 to 3 February 2023.

Participants: Patients who had a history of recurrent UTI with at least one documented positive urine culture in our facility and whom no significant abnormality on ultrasound or cystoscopy was found, were included in the study. Patients with no documented positive urine culture prior to the installation were excluded from the study. There was a total of 40 patients who underwent a single dose intravesical gentamicin instillation for recurrent UTI during our study period.

Regimen:
In our facility intravesical gentamicin instillation occurs in the operation theatre under anaesthesia and is proceeded by cystoscopy. The dose used for gentamicin installation was 1mg/kg with an average of 80mg. The gentamicin is prepared in a 500ml saline solution and instilled in two divided doses. The first dose of 250ml gentamicin solution is instilled following cystoscopy and left for 10 minutes. After 10 minutes the initial gentamicin solution is drained and the remaining 250ml gentamicin solution is instilled and left for at least 2 -3 hours.

Outcome measures: Primary outcome measure was incidence of UTI during the first 3 , 6 and 12 month following treatment, Secondary outcome measures included adverse effects of treatment. The selected patient's electronic medical record were reviewed to collect the relevant information. Patients demographic details, comorbidities, body mass index, menopausal status and microbial pattern were collected.

Analysis: Continuous and categorical data were analysed using descriptive statistics and presented as means and percentages. Microsoft Excel 2019 was used to carry out further statistical analysis and association with $p < 0.05$ were considered statistically significant.

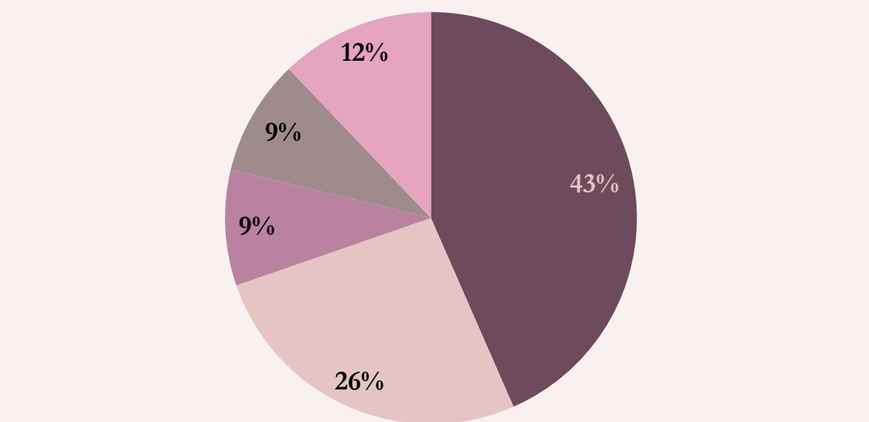

Figure 1. Distribution of pathogens causing recurrent UTI

Results

40 cases were included in the study, with most of the cases (85%) being UAE nationals. The included participant's ages ranged from 18 to 86 with mean age being 54 years. Most of the participants had comorbidities (70%), with diabetes mellitus being the most common reported comorbidity. Only 32.5% of cases had body mass index within the normal range, were as the rest of the participants were overweight (27.5%), obese (35%) or morbidly obese (5%). There was an almost equal distribution of menopausal to non-menopausal women, 21 to 19 participants respectively.

Of the 40 cases included in the study 19 of them had recurrence of urinary tract infection during the study period, leading to a recurrence rate of 47.5% post intravesical instillation of gentamicin. The majority of recurrence occurred within the first 3 months post instillation (68%), while the rest of the recurrence occurring equally between 3-6 months (16%), and greater than 6 months (16%). Out of the 19 cases with recurrence of UTI post treatment, 8 (42 %) had diabetes mellitus type II; in contrast to only one case of type II diabetes mellitus in the non-recurrence group.

Only one case reported side effect of abdominal pain post procedure, no other side effects where reported. The most common organisms causing recurrence of urinary tract infection where E.coli (43%) and Klebsiella pneumonia (26%).

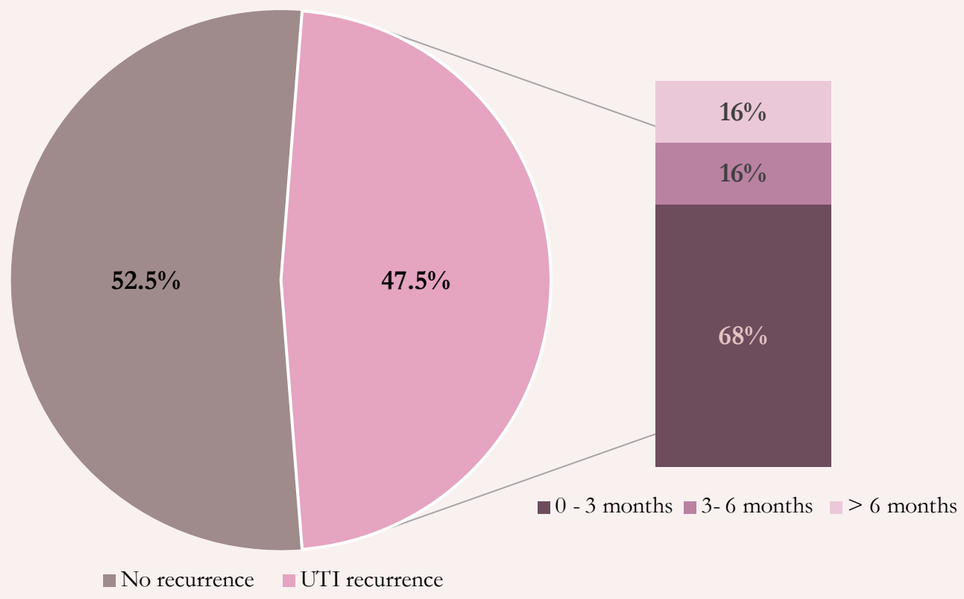

Figure 2. Recurrence of UTI post IVI Gentamicin

Interpretation of Results

The results showed good response with acceptable cure and success rate in more than 50 % of patients who are known to have recurrent UTI, considering the background comorbidities and risk factors in this group of patients. It also shows that the patients tolerated the treatment very well, with no evidence of major side effect.

The findings showed no significant correlation between obesity and recurrence of urinary tract infections. In addition, the menopausal state does not correlate with the recurrence rate. In contrast, diabetes mellitus type II had a great impact on failed treatment and requiring further treatment.

E.coil was the most common organism to cause of recurrent urinary tract infection in our study, which is in keeping with published literature.[2]

Conclusion

Intravesical gentamicin instillation is an effective and safe treatment option for patients with recurrent UTI. The success of single dose intravesical gentamicin instillation for recurrent UTI may be influenced by patient comorbidities, such as the presence of underlying medical condition like diabetes mellitus.

Further research is required to determine the optimal dosing regimen and duration for intravesical instillation of gentamicin. The potential impact of specific comorbidities on the success of gentamicin therapy for recurrent UTI should also be investigated.

References

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