

Original Research**Association Of Bacterial Vaginosis With Recurrent Urinary Tract Infection In Women Of Reproductive Age Group.**

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**Abstract :** Bacterial vaginosis is the common vaginal infection among women of reproductive age, with incidence varying from 15-65 Many serious obstetric and gynaecological complications have also been associated with bacterial vaginosis. Bacterial vaginosis is found to be a critical risk factor found associated with recurrent even mortality: as such management of women with recurrent urinary tract infections involves evaluation and treatment of genital tract infections. **Objectives:** Therefore this study was conducted with the primary objective to evaluate the association of Bacterial vaginosis with recurrent urinary tract infection and assess its prevalence in women of reproductive age group; at Rama Medical College Hospital & Research Centre Mandhana, Kanpur over a period of one year **Material & Methods:** Vaginal swab specimens were collected from the females with "culture confirmed" recurrent UTI for further processing to diagnose the associated Bacterial Vaginosis using Amsel criteria. **Result:** It was observed that among 146 women presenting with culture confirmed RUTI, 49.32% had associated Bacterial vaginosis. The prevalence of Bacterial vaginosis was found to be higher (59.50%) among the women of reproductive age group (15-44 years) : which is highly significant with  $x^2 = 16.10$ . **Conclusion:** On the basis of study it is concluded that the management of women with recurrent urinary tract infections involves evaluation and treatment of genital tract infections as well; such as the highly prevalent Bacterial vaginosis.

**Key words:** Recurrent urinary tract infection, Bacterial vaginosis, urogenital tract infection, women.

**INTRODUCTION**

Bacterial Vaginosis (BV) is the most common vaginal infection among women of reproductive age, with incidence varying from 15-65%.<sup>1</sup> It is the most common cause of vaginal discharge in women of childbearing age, accounting for 40 to 50 percent of cases.<sup>2</sup> The absence of inflammation is the basis for the term "vaginosis" rather than "vaginitis". The major bacteria detected are Gardnerella vaginalis, Prevotella species, Porphyromonas species, Bacteroides species, Peptostreptococcus species, Mycoplasma hominis, Ureaplasma urealyticum, and Mobiluncus species.<sup>3</sup> Bacterial vaginosis represents a complex change in the vaginal flora characterized by a reduction in concentration of the normally dominant hydrogen-peroxide producing lactobacilli and an increase in concentration of other organisms, especially anaerobic gram negative rods.

Sexual activity is a risk factor for Bacterial vaginosis, and most experts believe that BV does not occur in women who have never had vaginal intercourse.<sup>4</sup> A systematic review and meta-analysis concluded that BV is significantly associated with sexual contact with new and multiple male and female partners and decreasing the number of unprotected sexual encounters may reduce incident and recurrent infection.<sup>5</sup> Among

sexually active women, additional risk factors for acquisition of BV include multiple or new sexual partners, douching, and cigarette smoking.<sup>6</sup> Use of condoms and estrogen-containing contraceptives may be protective factors.<sup>7</sup> Fifty to 75 percent of women with Bacterial vaginosis are asymptomatic. Symptomatic women typically present with vaginal discharge and/or vaginal odour.<sup>8</sup> The discharge is off-white, thin, and homogeneous; the odour is an unpleasant "fishy smell" that may be more noticeable after sexual intercourse and during menses.<sup>9</sup>

Many serious obstetric and gynaecological complications have been associated with bacterial vaginosis, such as preterm labour and delivery, premature rupture of membranes, chorioamnionitis and endometritis.<sup>10</sup> Bacterial Vaginosis is also found to be a critical risk factor found associated with recurrent urinary tract infection (RUTI) in women.<sup>11</sup> Some 20-40 per cent of women with an initial urinary infection will have recurrence.<sup>12</sup> Recurrent urinary tract infections may be associated with significant morbidity and even mortality. Being a critical urogenital risk factors in the development of recurrent urinary tract infection, various measures are being explored to prevent and treat Bacterial vaginosis; thus reducing the potential for recurrent urinary tract infections. Therefore this study was conducted with the

primary objective to evaluate the association of Bacterial vaginosis with recurrent UTI and assess its prevalence in women of reproductive age group.

## MATERIAL AND METHOD

**Study design and protocol:** The present study was conducted by the department of Pharmacology at Rama Medical College Hospital & Research Centre – Mandhana, Kanpur. The study was conducted over a period of one year, from June 2013 to May 2014. This is a simple random sample, hospital based, epidemiological descriptive study, conducted after due approval from the institutional Medical Ethics Committee. A total of 146 female patients with “culture confirmed” recurrent UTI, visiting the outpatient clinics of Rama Medical College Hospital were included in the study. Pregnant women, patients suffering from renal disease, STDs, any chronic illness, immunocompromised patients, bedridden patients, paraplegics and neurogenic bladder cases; were excluded from the study.

**Sample collection and processing:** Vaginal swab specimens were collected from women with “culture confirmed” recurrent UTI for further investigations, to diagnose the associated BV.<sup>13</sup> The vaginal swab samples were further processed to diagnose the associated Bacterial Vaginosis using Amsel criteria. In clinical practice, the diagnosis of bacterial vaginosis in premenopausal women is usually based on the presence of at least three of the four Amsels criteria.<sup>14</sup>; homogenous white adherent vaginal discharge, vaginal pH >4.5, fishy amine odour from vaginal fluid when mixed with 10% potassium hydroxide and presence of clue cells in at least 20% of epithelial cells on a saline wet mount.

“Culture confirmed” RUTI patients were picked up from the outpatient clinics of Rama Medical College Hospital; in consistence with the definition of RUTI, which is 2 or more than 2 episodes of UTI in a period of 6 months.<sup>15</sup> Diagnosis was confirmed by the culture results of the urine samples of patients presenting with symptoms of recurrent UTI; by the concerned physician and labelled as “culture confirmed “ RUTI cases. A written/verbal informed consent was taken from the patients involved in the study and a detailed medical history was collected from all consenting patients for eligibility screening. All infections were then treated by the concerned physician, with appropriate antibiotics. The association of BV in patients of culture confirmed RUTI was evaluated

and the prevalence of BV during the reproductive age group; 15 – 44 years<sup>16</sup> was assessed.

**Statistical analysis:**Data analysis was performed using the SPSS windows version 16.0 software. Tests of significance were applied to find out the results and value of  $P < 0.05$  was considered statistically significant. Chi-square test was applied for statistical analysis.

## OBSERVATION AND RESULTS

In our study we observed that among 146 women presenting with culture confirmed RUTI, 72 (49.32%) had associated UGTI – Bacterial Vaginosis. BV was found to be highly prevalent among the women of reproductive age group but quite rare in the rest of the age categories. Considering the reproduction age group broadly from 15-44 years, it was observed that out of 121 women with RUTI in this category, 72 had associated BV, which raises its prevalence to 59.50% (72/121) in our study; which is highly significant ( $p < 0.001$ ) with Chi-square = 16.10 (DF = 1) and Odds Ratio (OR) = 6.8.

**Table – 1: Distribution of cases of BV in non-reproductive and reproductive age groups.**

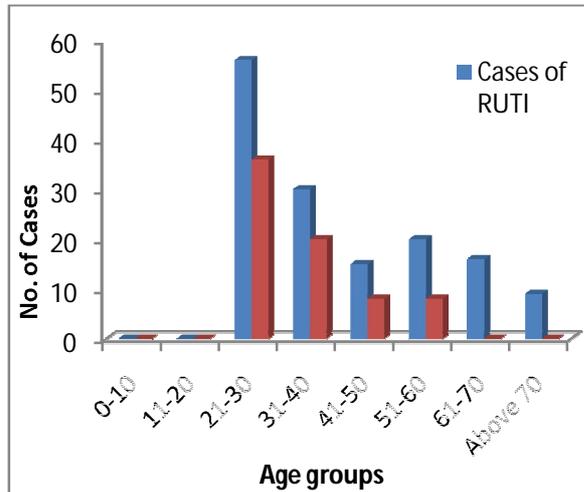
	Bv-Negative Cases	Bv-Positive Cases	Total
Non-Reproductive Age Group	25	5	30
Reproductive Age Group (15-44 Yrs.)	49	67	116
Total	74	72	146

**Statistically highly significant ( $p < 0.001$ ),  $\chi^2 = 16.10$  (DF = 1), Odds Ratio (OR) = 6.8.**

## DISCUSSION

From the observations of this study it was found that among the 146 women presenting with culture confirmed RUTI, 72 (49.32%) had associated UGTI – Bacterial Vaginosis. It was observed that the recurrent UTI associated with Bacterial vaginosis, had a high distribution among the women of reproductive age group (15-44 years) and quite rare in the rest of the age groups; raising its prevalence to 59.50% in the reproductive age group which is highly significant, with  $\chi^2 = 16.10$

These results are strongly supportive of association of BV with RUTI and sexual activity during the reproductive age group.<sup>10</sup>



**Fig. 1: Distribution of Recurrent UTI and Associated Bacterial Vaginosis as a Function of Age**

**Sumati et al**<sup>17</sup> observed similar findings as ours, in a study where a total of 119 (68.39%) of the 174 women had bacterial vaginosis, whereas 58 women showed presence of urinary tract infection. Once the difference in pregnancy status was taken into account, women with BV had odds of experiencing urinary tract infection that were 13.75 times more when compared with women who did not have BV. **Maryam Afrakhteh**<sup>18</sup> and associates in a case-control study examined 67 patients with UTI and compared them with 67 normal individuals. BV was reported in 40.3% and 62.7% in the control group and study group, respectively. **Hillerbrand et al**<sup>11</sup> in a cross-sectional study examined 503 pregnant women from the viewpoint of urinary tract infections and BV who came for initial prenatal visit and they concluded that BV in pregnancy increases the risk of UTI.

Recurrent urinary tract infections are one of the most troublesome and prevalent infections seen in women of young age group. Worsening the situation even more is the fact that recurrent urinary tract infections associated with urogenital tract infections might be misdiagnosed and inadequately treated as simple recurrent urinary tract infections.<sup>19</sup> Many serious obstetric and gynecological complications have also been associated with bacterial vaginosis.<sup>10</sup> Association

of BV with UTI (vice versa) probably begins with an increase in the pH of the vagina because of reduction of vaginal lactobacilli-producing lactate and hydrogen peroxide.<sup>20</sup> The normal vaginal flora may be replaced by predominantly anaerobic flora.<sup>11</sup> Frequent sexual intercourse, which was also linked to both these infections, may also contribute to this phenomenon<sup>10</sup>; thereby making it a disease of reproductive age group (15-44 years), being quite rare in the rest of the age groups; which is in consistence with the results of our study. Hence it is recommended to carry out test for urinary tract infections in women with bacterial vaginosis.

Bacterial vaginosis resolves spontaneously in up to one-third of non-pregnant and one-half of pregnant women.<sup>21</sup> Treatment is indicated for relief of symptoms in women with symptomatic infection. The United States Centers for Disease Control and Prevention recommends to not treat asymptomatic women. Although many clinicians regard BV as a fairly insignificant condition warranting no treatment, it is mainly associated with sexually transmitted diseases and recurrent UTI. On the other hand the initial therapy of UTIs on the other hand is usually empirical, but unfortunately antibiotic resistance may develop in uropathogens due to frequent misuse of antibiotics. However clinical management of RUTI in pregnant women might be more complicated because of potential perinatal problems. As such management of women with recurrent urinary tract infections involves evaluation and treatment of genital tract infections as well. Subsequent modifications in the management of RUTI have to be made on the basis of associated urogenital infections, such as the highly prevalent BV and the pattern of urine culture & susceptibility results.

## CONCLUSION

From the observations of this study it may be concluded that Recurrent UTI associated with UGTI – Bacterial Vaginosis, has a high prevalence of 59.50%, among the women of reproductive age group. The management of recurrent UTIs remains an interesting subject of research as they are associated with a wide range of Multi Drug Resistant pathogen strains, risk factors as well as urogenital complications. It is hoped that findings from this study would be helpful in ensuring effective management of recurrent UTI associated with BV and would in turn reduce the associated complications and morbidity. We also recommend further studies to better understand the public health impact of urogenital tract infections

associated with recurrent UTI; and compile the best recommendations for prevention of both RUTI and BV.

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