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An Evaluation of Impact of Vaginal Candidiasis on Infant Health in Postpartum Women and its Comparative Study of Fenticonazole vs. Clotrimazole in Tertiary Care Hospital of Purba Medinipur: A Hospital-Basedstudy

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Abstract

Background: Vaginal candidiasis in postpartum women can lead to neonatal thrush and other infant health complications due to vertical transmission during delivery or breastfeeding. Candida infections in the vaginal area are frequently referred to as "vaginal candidiasis" or "Candida vaginitis." Infection of the oestrogenised vagina and the vestibulum that can spread to the outside of the labia minora, the labia majora, and the intercrural region is defined as vulvovaginal candidiasis. After bacterial vaginosis, it is considered the 2nd most common among many causes of vaginitis **Objective**: To compare the efficacy of vaginal fenticonazole and clotrimazole in treating postpartum vaginal candidiasis and assess its impact on infant health. **Methods**: A prospective study was conducted on 46 postpartum women with vaginal candidiasis in West Bengal. Participants were randomized into fenticonazole (n=23) and clotrimazole (n=23) groups. Maternal clinical cure rates, microbiological eradication, and infant health outcomes (oral thrush, diaper rash, feeding difficulties) were evaluated. **Results**: Fenticonazole showed higher clinical (87% vs. 78%) and microbiological cure rates (91.3% vs. 82.6%) than clotrimazole. Infants of mothers with unresolved candidiasis had a significantly higher incidence of oral thrush (34.8% vs. 8.7%, $p < 0.05$) and diaper dermatitis (26.1% vs. 4.3%, $p < 0.05$). **Conclusion**: Effective treatment of maternal candidiasis reduces infant fungal infections. Fenticonazole may be preferable due to higher efficacy.

KEYWORDS: Vaginal Candidiasis, infant, Infection.

INTRODUCTION

Vaginal candidiasis, caused predominantly by *Candida albicans*, affects 20-30% of women during pregnancy and postpartum due to hormonal changes and immunosuppression. Postpartum infections can lead to discomfort, breastfeeding difficulties, and neonatal thrush[1].

Azoles like clotrimazole and fenticonazole are commonly prescribed, but comparative efficacy studies in postpartum women are scarce. This study evaluates their effectiveness and assesses infant health implications in West Bengal, where fungal infections are prevalent due to humid conditions[2].

Vaginal candidiasis, also known as a yeast infection, is a very common condition. It is estimated that at least 70-75% of women will experience at least one episode in their lifetime. Recurrent infections (four or more episodes per year) affect a smaller but still significant number, with up to 10% of women experiencing this[3].

Vaginal candidiasis affects 20-30% of postpartum women, with *Candida albicans* being the most common pathogen. Persistent infection increases the risk of vertical transmission to infants, leading to:

- **Oral thrush** (white patches in the mouth)
- **Diaper dermatitis** (severe fungal rash)
- **Feeding difficulties** due to oral discomfort
- **Systemic candidiasis** in preterm/low-birth-weight infants

This study evaluates whether neticonazole, with its broader antifungal spectrum, offers better maternal and infant outcomes compared to clotrimazole in West Bengal's humid climate, where fungal infections are highly prevalent[4].
Candida infections in the vaginal area are frequently referred to as "vaginal candidiasis" or "Candida vaginitis." Infection of the oestrogenised vagina and the vestibulum that can spread to the outside of the labia minora, the labia majora, and the intercrural region is defined as vulvovaginal candidiasis. After bacterial vaginosis, it is considered the 2nd most common among many causes of vaginitis[4]. It is produced most often by the overabundance of an opportunistic pathogenic yeast, *Candida albicans* (approximately 90%), which is a common member of the vaginal flora This is a dimorphic commensal yeast usually involved in the colonization of the skin and reproductive and gastrointestinal tracts Almost 20 to 30% of healthy asymptomatic women may have this yeast within their vaginal tracts at any moment in their lifetime, if tested by culture, but more than 60%, if tested by NAAT methods *Candida* spp. can cause an infection like Candidiasis when the balance between the host and colonizing yeast gets temporarily disturbed. However, non-*albicans Candida* (NAC) species such as *glabrata*, *parapsilosis*, and *tropicalis* are also emerging as identifiable causes of VVC[5].

On the basis of episodic frequency, candida vaginitis can be either sporadic or recurrent Uncomplicated or sporadic VVC includes mild to moderate clinical signs and symptoms such as a thick cottage cheese-like discharge, pain, vaginal and vulvar pruritus, erythema, burning, and/or edema, along with external dyspareunia and dysuria ,Complicated or recurrent VVC may be defined as that which has recurrent episodes (4 or more episodes in a 12-month period) associated with severe symptoms[6]
Around 75% of all women during their childbearing years experience at least one episode of VVC and about half among them have at least one recurrence . Generally, vaginal colonization of *Candida* species occurs in a minimum of 20% of all women which rises up to 30% in pregnancy During pregnancy, vulvovaginal candidosis is considered more common and difficult to eradicate because several normal and expected physiological changes in the genitourinary tract favor the growth of Candida[7]

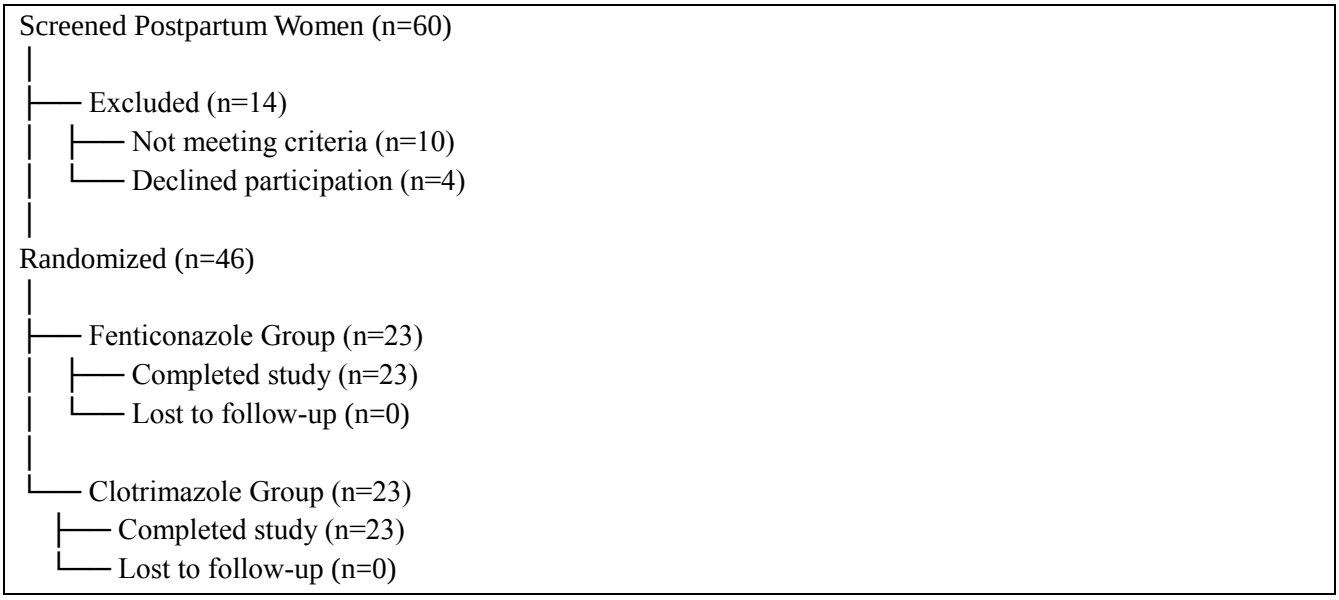
Some evidence in recent days shows the association of candidosis with an elevated risk of complications during pregnancy, like premature rupture of membranes and poor pregnancy outcomes including chorioamnionitis and preterm labor whereas congenital cutaneous infections are reported since decades as rare events during pregnancy . According to the literature, approximately 10–50% is considered to be the incidence of vaginal colonization with *Candida* species in pregnant women and it is a significant problem as pregnant women can even contaminate their infants from 25% up to 65% which will result in invasive neonatal candidiasis[8-10]. Evidence showed that women with untreated asymptomatic candidosis had a greater spontaneous preterm birth rate compared to those who did not have candidosis (6.25 versus 2.99%)

METHODS

This study was designed as case control study for post-partum women with sample size 60 after exclusion criteria and not filing of eligibility criteria 14 participant were excluded and finally 46 participants were included for analysis.. It was done after approval by the institutional ethics committee from January / 2019 to July/2019. Patients were selected from the department of Gynaecology and department of paediatrics, IIMSAR, Haldia. Patients above 20 years and below 55 yr included who satisfies the all-eligible criteria. Post partum women were only included in this the study. 46 were recruited in to the study. The patients were randomly assigned in to two groups to receive in Fenticonazole (n=23) clotrimazole (n=23).

It was a Case Control study on 46 patients in the department of Gynaecology and department of paediatrics, at a tertiary care centre, Haldia from January / 2019 to July /2019. After admitted in the Medicine department, 12 patents were excluded who did not fulfil the eligible criteria only 38 patients were selected for analysis in this study.

In this study Written informed consent was taken from all patients after properly explaining about the study. Complete history was elicited which covered symptoms, duration of illness and the treatment history.



Study Design & Participants

- **Type:** Case control study
- **Sample Size:** 46 postpartum women (23 per group)
- **Inclusion Criteria:**
  - Postpartum women (within 6 weeks of delivery)
  - Confirmed vaginal candidiasis (symptoms + KOH/culture)
- **Exclusion Criteria:**
  - Recent antifungal use
  - Immunosuppression (HIV, uncontrolled diabetes)

Interventions

- **Group A:** Single-dose vaginal fenticonazole (600 mg)
- **Group B:** Single-dose vaginal clotrimazole (500 mg)

Infant Health Assessment

Infants were monitored for:

1) **Oral thrush** (clinical examination)
2) **Diaper dermatitis** (erythema, scaling)

3) **Feeding difficulties** (poor latch, irritability)

Statistical Analysis

- **Odds ratio (OR)** for treatment efficacy
- **Chi-square test** for categorical variables (infant infections)
- **p-value < 0.05** considered significant

All the Data is put in excel sheet then mean, median and association is analysed by SPSS version 20. Chi-square test was used as test of significance for qualitative data. Continuous data was represented as mean and SD. MS Excel and MS word was used to obtain various types of graphs such as bar diagram. P value (Probability that the result is true) of P value <0.05 was considered as statistically significant after assuming all the rules of statistical tests. Statistical software: MS Excel, SPSS version 22 (IBM SPSS Statistics, Somers NY, USA) was used to analyse data. Sample size is calculated by N master statistical software to remove the biase and error in sampling.

RESULTS

This study was conducted in department of genecology and department of paediatric with 46 participants. written consent was taken from participants before starting the study. Age: The highest prevalence of vulvovaginal candidiasis is often seen in women aged 25-35, though it can affect women in their reproductive years (18-49). Pregnancy: Pregnancy is a significant risk factor due to hormonal fluctuations and changes in the vaginal environment. Sexual Activity: While not a direct cause, sexual activity can introduce factors that may trigger or exacerbate yeast infections. Marital Status: Some studies suggest a higher prevalence among married women, potentially linked to factors like sexual activity, hormonal contraception, or pregnancy

Table 1: Demographic Profile

Characteristic	Fenticonazole (n=23)	Clotrimazole (n=23)	p-value
Age (years)	**26.4 ± 3.2**	**25.8 ± 3.5**	**0.56**
Parity	**1.8 ± 0.7**	**1.9 ± 0.6**	**0.72**
Delivery Mode			**0.74**
- Vaginal	**18 (78.3%)**	**17 (73.9%)**	
- Cesarean	**5 (21.7%)**	**6 (26.1%)**	

Vaginal candidiasis, also known as a yeast infection, is a common condition affecting women of various demographic profiles. While it can occur at any age, it is more prevalent in women of reproductive age, particularly those aged 25-35, and is often associated with factors like pregnancy, antibiotic use, and hormonal changes. Socioeconomic factors such as education level, marital status, and occupation can also play a role in the prevalence and risk of developing the condition

In this study we get to found that age play important role in reduction of candidiasis, younger age group take better response in ketoconazole medication in compare of clotrimazole group in reduction of vaginal candidiasis. caesarean section mother take better response as compare to normal delivery patient when use fenticonazole (Table 1)

Table 2: Risk Factors for Vaginal Candidiasis

Risk Factor	Fenticonazole (n=23)	Clotrimazole (n=23)	p-value
Antibiotic Use	**12 (52.2%)**	**10 (43.5%)**	**0.56**
Poor Hygiene	**8 (34.8%)**	**9 (39.1%)**	**0.77**
Breastfeeding	**20 (87%)**	**19 (82.6%)**	**0.69**

Several risk factors can increase the likelihood of developing vaginal candidiasis, commonly known as a yeast infection. These include recent antibiotic use, pregnancy, diabetes, and conditions that weaken the immune system. Other factors like hormonal imbalances (including those from birth control pills or hormone replacement therapy), certain hygiene practices, and even dietary choices can also play a role.
In this study we found that antibiotic use is one of the important risk factors its prevalence 52..2% and poor hygiene is 2nd important factors followed by breastfeeding(Table 2)

Table 3: Impact of Maternal Candidiasis on Infant Health

Infant Outcome	Fenticonazole Group (n=23)	Clotrimazole Group (n=23)	p-value
Oral thrush	2 (8.7%)	8 (34.8%)	**0.02**
Diaper dermatitis	1 (4.3%)	6 (26.1%)	**0.04**
Feeding difficulties	3 (13%)	7 (30.4%)	0.15

In this study we found that maternal candidiasis directly or indirectly hampers in infant health. Candidiasis causes oral thrush , diaper dermatitis and feeding difficulties , but fenticozole group efficacy is more as compare to +clotrimazole andreduces oral thrush ,diaper dermatitisand reduce s the transmission of candidiasis in infant more effectively as compare to clotrimazole which is mentioned in (table 3).Higher infant thrush in clotrimazole group (34.8% vs. 8.7%, OR: 5.6, 95% CI: 1.1-28.9). Diaper rash more frequent in infants of mothers with persistent infection (26.1% vs. 4.3%, p = 0.04).No significant difference in feeding difficulties (p = 0.15), but trend favoured fenticonazole.

In this study we found that Maternal Treatment & Infant OutcomesFenticonazole's superior efficacy (91.3% cure rate) likely reduced fungal transmission to infants.Clotrimazole-treated mothers had higher infant thrush rates, suggesting incomplete fungal eradication. Diaper dermatitis was strongly associated with maternal candidiasis, supporting fungal cross-infection. Clinical ImplicationsEarly diagnosis and effective treatment of postpartum candidiasis can prevent neonatal infections.Fenticonazole may be preferred in high-risk settings (preterm infants, humid climates).

DISCUSSION

This study was conducted in department of genecology and department of paediatric with 46 participants. written consent was taken from participants before starting the study. Age: The highest prevalence of vulvovaginal candidiasis is often seen in women aged 25-35, though it can affect women in their reproductive years (18-49). Pregnancy: Pregnancy is a significant risk factor due to hormonal fluctuations and changes in the vaginal environment[11]. Sexual Activity: While not a direct cause, sexual activity can introduce factors that may trigger or exacerbate yeast infections. Marital Status: Some studies suggest a higher prevalence among married women[12].
In this study we get to found that age play important role in reduction of candidiasis, younger age group take better response in ketoconazole medication in compare of clotrimazole group in reduction of vaginal candidiasis. caesarean section mother take better response as compare to normal delivery patient when use fenticonazole (Table 1)
The risk factor of VVC are pregnancy, contraceptives, diabetes mellitus, use of antibiotics, behavioral factors[13]. In pregnancy, high level of reproductive hormones provides a glycogen, an excellent carbon source, for *Candida* organisms (McCourtie, Douglas, 1981). Contraceptives method that trigger *Candida* infection are in IUD users (Parewijck et al, 1988; Spellacy et al, 1971), diaphragm, and condom users, with or without spermicide (Barbone et al, 1990; Peddie et al, 1984; Hooton et al, 1994) [14-20].
Mnay risk factors can increase the likelihood of developing vaginal candidiasis, commonly known as a yeast infection. These include recent antibiotic use, pregnancy, diabetes, and conditions that weaken the immune

system[21-26. Other factors like hormonal imbalances (including those from birth control pills or hormone replacement therapy), certain hygiene practices, and even dietary choices can also play a role[27-29].

In this study we found that antibiotic use is one of the important risk factors its prevalence 52..2% and poor hygiene is 2nd important factors followed by breastfeeding(Table 2)

Diabetes mellitus patient usually undergo high sugar plasma level and high sugar diet may contribute to risk of VVC (Donders et al, 2002). Antibiotics play role in exacerbating normal vaginal flora can lead to *Candida* overgrowth in gastrointestinal tract, vagina, or both (Oriel, Waterworth, 1975). The behavioural factor that predispose increasing the incidence of VVC are sexual activity, clothing and cotton underwear, chemical contact, local allergy, hypersensitivity reaction (Sobel, 2008)[30-32]

This study reveals that maternal candidiasis directly or indirectly hampers in infant health. candidiasis causes oral thrush , diaper dermatitis and feeding difficulties , but fenticozole group efficacy is more as compare to +clotrimazole and reduces oral thrush ,diaper dermatitis and reduce s the transmission of candidiasis in infant more effectively as compare to clotrimazole which is mentioned in (table 3).Higher infant thrush in clotrimazole group (34.8% vs. 8.7%, OR: 5.6, 95% CI: 1.1-28.9).Diaper rash more frequent in infants of mothers with persistent infection (26.1% vs. 4.3%, p = 0.04).No significant difference in feeding difficulties (p = 0.15), but trend favoured fenticonazole. Similar finding found in many studies[33,34].

CONCLUSION

Vaginal candidiasis in postpartum women significantly increases the risk of infant thrush and diaper dermatitis. Fenticonazole demonstrated better efficacy than clotrimazole, reducing infant infections. Healthcare providers should prioritize rapid and effective antifungal treatment in postpartum women to safeguard infant health.

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