

## Study of Different Reproductive Tract Infections in Pregnant vs Non Pregnant Females



### Medical Science

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**Dr. Ajay Prajapati**

Resident doctor, S.C.L.Municipal general hospital, Saraspur. smt.N.H.L.Municipal medical college, ellisbridge.

**Dr. Pragma Jauhar**

Resident doctor, S.C.L.Municipal general hospital, Saraspur. smt.N.H.L.Municipal medical college, ellisbridge.

**Dr. Parsis Parmar**

Resident doctor, S.C.L.Municipal general hospital, Saraspur. smt.N.H.L.Municipal medical college, ellisbridge.

**Dr. Satish K. Kadikar**

Prof. of dept. of obs & gy. S.C.L.Municipal general hospital, Saraspur. smt.N.H.L.Municipal medical college, ellisbridge.

### ABSTRACT

*Reproductive tract infections (RTI) is a global health problem in women, especially in South East Asian region countries. They may progress to serious complications and may cause a high degree of morbidity during the sexually active period of life.*

*The present study was undertaken from July 2014 to July 2015 to find the prevalence of reproductive tract infection among 50 pregnant vs 50 non pregnant women of reproductive age, prevalence of suggestive symptoms of RTI, their pattern in pregnancy and relation of these symptoms with socio-demographic variables, reproductive characteristics.*

*Among the patients attending the Gynae OPD of S.C.L. Hospital, Saraspur, Ahmedabad, 50 women in each pregnant and non pregnant of the reproductive age group (15 to 45 yrs) were interviewed through a pre designed and pre tested schedule after obtaining their informed consent.*

*Following the prospective study of RTI in 50 pregnant and 50 non pregnant women, it was found that majority of women with RTI belonged to age group of 26-34 years, had an early marriage, with one or more abortion, with no contraceptive practice, lack of reproductive hygiene and who were poorly nourished and immunocompromised.*

*Education of women, improvement of nutritional status, routine screening, early diagnosis and treatment can prevent majority of RTI among women.*

### INTRODUCTION

Reproductive tract infections (RTI) is a global health problem in women, especially in South East Asian region countries. They may progress to serious complications and may cause a high degree of morbidity during the sexually active period of life. More than a million women and infants die of the complications of RTI every year. RTI has become a silent epidemic that devastates women's life<sup>[1]</sup>.

#### Globally, RTIs include three types of infections:

1. **Sexually transmitted infections (STDs)**, such as Chlamydia, gonorrhoea, trichomoniasis, chancroid, and HIV
2. **Endogenous infections**, which are caused by overgrowth of organisms already present in the genital tract of healthy woman, such as bacterial vaginosis or vulvovaginal candidiasis
3. **Iatrogenic infections** related to medical procedures (such as menstrual regulations, abortion and IUCD insertion)<sup>[2]</sup>

In developing countries, both the incidence and prevalence of RTIs/STIs are very high, they rank second as the cause of healthy life lost among women of reproductive age group, after maternal morbidity and mortality.<sup>[3]</sup>

In India, statistics pertaining to RTI are meagre. The burden of untreated RTIs is especially heavy for women because these infections are often asymptomatic or the symptoms are not recognizable. Or refuse to seek health care due to economic, time and social constraints.<sup>[4]</sup>

With the above mentioned background, the present study was undertaken from July 2014 to July 2015 to find the prevalence of reproductive tract infection among 50 pregnant vs 50 non pregnant women of reproductive age, prevalence of suggestive symptoms of RTI, their pattern in pregnancy and relation of these

symptoms with socio-demographic variables, reproductive characteristics and contraceptive practices. The above carried study was compared with standard studies done in RTI by Goto et al (2004)<sup>[5]</sup> and Begum et al (2003)<sup>[6]</sup> in pregnant women and by Aparajita et al (2008)<sup>[7]</sup> and Nandan et al (2002)<sup>[8]</sup> amongst non pregnant females and results were concluded accordingly.

### AIMS AND OBJECTIVES

- To find out the prevalence of suggestive symptoms of RTI among women of reproductive age group.
- To know the relationship of acquiring RTI during pregnancy.
- To know the pattern of RTI in pregnant females and its difference in distribution from non pregnant females.
- To probe the variations in magnitude and nature of RTIs across women in different socio-economic, demographic and reproductive characteristics.
- To know the measures to reduce RTI in women.

### MATERIALS AND METHODS

Among the patients attending the Gynae OPD of Shardaben Hospital, Ahmedabad, 50 women in each pregnant and non pregnant of the reproductive age group (15 to 45 yrs) with complaints of leucorrhoea, pruritis vulva, backache, lower abdominal pain, burning micturition, menstrual irregularities, dyspareunia, recurrent pregnancy losses, primary infertility were interviewed through a pre designed and pre tested schedule after obtaining their informed consent.

The patients were selected randomly irrespective of age, parity, reproductive characteristics, pregnancy and socio-economic conditions.

#### Three basic tools were used for data collection:

- Conducting a questionnaire
- Having clinical examinations based on syndromic approach
- Lab diagnosis to ascertain the presence of infections.

After taking detailed history, patients were taken on table for examinations in lithotomy position. By inspection, condition of vulva and adjacent area was noted. The amount and type of discharge was noted then after proper exposure and introducing speculum, the condition of vagina and cervix was noted.

Sterile swab was taken from posterior fornix and slide prepared from it and was out in a fixative jar. Similarly, discharge was taken from cervix and sent for Pap staining. Drop of discharge was taken on clean and dry glass slide and examined under low power then high power.

- If *Trichomonas* are present, they are seen as actively moving organisms amongst the pus cells and epithelial cells.
- If candida is suspected, KOH mount is prepared. Blue coloured candida with pseudomycelia stands against light blue background.
- If bacterial diagnosis is present, vaginal epithelial cells are seen covered with cocobacilli and cells have stippled or granular appearances, Clue cells.

| Organisms/syndrome  | Test performed   | Diagnostic criteria  |
|---------------------|--|--|
| Bacterial vaginosis | KOH + Whiff test<br>wet mount<br>gram stain<br>culture | Positive whiff test<br>Clue cells >20%<br>Cells observed<br>Positive culture |
| Syphilis            | VDRL/RPR test  | Positive test  |
| Trichomoniasis      | Wet mount preparation                                  | <i>Trichomonas vaginalis</i> observed on wet mount preparation               |
| Candidiasis         | Vaginal gram stain culture                             | budding yeasts observed<br>Culture of <i>C.Albicans</i>                      |
| Gonorrhoea          | gram stain<br>microbiologic culture                    | Gram negative diplococci<br>Positive culture                                 |
| Chlamydia           | culture<br>direct fluresense antibody                  | Positive culture<br>Positive antibody  |
| Genital herpes      | smear from lesion for<br>microbiologic culture         | Positive culture   |
| Chancroid           | Culture  | Positive culture   |
| HPV                 | Endo/ecto cervix cells                                 | Cellular morphology  |
| HIV                 | ELISA/Western blot                                     | Positive test  |
| Hepatitis B         | ELISA  | Positive test  |
| Others              | Vaginal/cervical smear for culture                     | Positive culture   |

Analysis and comparison between two observational groups done by Chi Square test.

**OBSERVATION AND DISCUSSION**

**Table 1: Age wise distribution**

|         | Pregnant (N = 50) (%) | Non pregnant (N = 50) (%) | P value |
|---------|-----------------------|---------------------------|---------|
| ≤ 18    | 1 (2%)                | 5 (10%)                   | P<0.05  |
| 19 - 25 | 11 (22%)              | 10 (20%)                  |         |
| 26 - 34 | 36 (72%)              | 23 (46%)                  |         |
| ≥35     | 3 (6%)                | 13 (26%)                  |         |

It was statistically significant (p<0.05) with RTI infections being more common in pregnant females of 26-34 years as compared to non pregnant. Majority of infections belong to the age group 26-34 years (72% in the pregnant and 46% in non pregnant) because these are the sexually most active women.[5]

**Table 2: Age at marriage**

| Age at marriage | Present study (Pregnant) (N = 50) % | Begum et al (2003) (N = 284) | Present study (Non pregnant) (N = 50) % | Aparajita et al (2008) (N = 91) |
|-----------------|-------------------------------------|------------------------------|---|---------------------------------|
|                 |                                     |                              |   |                                 |

|     |          |            |          |          |
|-----|----------|------------|----------|----------|
| <18 | 43 (86%) | 173 (60.9) | 35 (70%) | 86 (94%) |
| >18 | 7 (14%)  | 106 (37.3) | 15 (30%) | 5 (5%)   |

No association (P>0.05) is observed between age at marriage and presence of RTI in women with pregnancy status. It was observed that maximum number of women have RTI with marriage at age less than 18 years showing 86% in pregnant and 70% in non pregnant women. Here study by Begum et al<sup>[6]</sup> in Bangladesh shows app 2/3<sup>rd</sup> of pregnant women with symptoms of RTI who have got married earlier than 18 years. Aparajita et al<sup>[7]</sup> study found 60% prevalence in those who married at age between 15-19 years.

**Table 3: Marital status**

| Married status      | Pregnant N = 50 (%) | Goto et al (2004) | Non pregnant N = 50 (%) | Agrawal et al (2013) | P Value |
|---------------------|---------------------|-------------------|-------------------------|----------------------|---------|
| Married             | 49 (98%)            | 80%               | 43 (86%)                | 87%                  | P<0.05  |
| Unmarried           | 0                   |                   | 5 (10%)                 | 6%                   |         |
| Separated/ Divorced | 1 (2%)              | 20%               | 2 (4%)                  | 7%                   |         |

Prevalence of RTI was more in married females, 98% in pregnant and 85% in non pregnant. Divorced and those who were living separate from husband, did not report any extra marital sexual relation and prevalence of RTI/STI was only 2% in pregnant and 4% in non pregnant.

**Table 4: Distribution of RTI according to symptoms**

| Symptoms              | Pregnant N = 50 (%) | Non pregnant N = 50 (%) |
|-----------------------|---------------------|-------------------------|
| Vaginal discharge     | 48 (96%)            | 44 (88%)                |
| Lower abdominal pain  | 37 (74%)            | 32 (64%)                |
| Urinary complaints    | 35 (70%)            | 28 (56%)                |
| Itching               | 33 (66%)            | 25 (50%)                |
| Backache              | 29 (58%)            | 17 (34%)                |
| Dyspareunia           | 11 (22%)            | 23 (46%)                |
| Leaking p/v           | 6 (12%)             | 0                       |
| Genital lesion        | 5 (10%)             | 8 (16%)                 |
| Menstrual abnormality | 0                   | 6 (12%)                 |

In our study, commonest symptom of RTI/STI was vaginal discharge (96% in pregnant and 88% in non pregnant women), followed by lower abdominal pain (74% in pregnant and 64% in non pregnant).

**Table 5: Types of infection**

| Infection            | Pregnant N = 50 (%)   | Non pregnant N = 50 (%) | P value  |        |
|----------------------|-----------------------|-------------------------|----------|--------|
| Endogenous infection | Candidiasis           | 25 (50%)                | 16 (32%) | P<0.05 |
|                      | Bacterial vaginosis   | 10 (20%)                | 23 (46%) |        |
|                      | GBS                   | 0                       | 1 (2%)   |        |
| STI                  | Hepatitis B           | 3 (6%)                  | 1 (2%)   |        |
|                      | Syphilis              | 1 (2%)                  | 1 (2%)   |        |
|                      | Gonorrhoea            | 0                       | 0        |        |
|                      | Trichomoniasis        | 5 (10%)                 | 3 (6%)   |        |
|                      | HIV                   | 3 (6%)                  | 2 (4%)   |        |
|                      | Herpes pro-genitalis  | 1 (2%)                  | 1 (2%)   |        |
|                      | Molluscum contagiosum | 1 (2%)                  | 1 (2%)   |        |
| Genital warts        | 1 (2%)                | 1 (2%)                  |          |        |
| Chlamydia            | 0                     | 0                       |          |        |

In our study, the endogenous infections were more prevalent among pregnant women (70%). Out of them, most prevalent was candidiasis (50%), followed by bacterial vaginosis (20%). STI was

less except Trichomoniasis (10%), Hepatitis B (6%), HIV (6%). Among non pregnant women, prevalence of endogenous infection was 78%, where maximum contributed by bacterial vaginosis (46%) followed by candidiasis (32%). The likelihood of candidiasis amongst endogenous infections during pregnancy is due to high levels of estrogen and progesterone, where progesterone has suppressive effect on anti-candida activity of neutrophils and estrogen decreases immunoglobulins in vaginal secretions.

**Table 6: Reproductive Hygiene**

| Reproductive hygiene | Pregnant N = 50 (%) | Non pregnant N = 50 (%) |
|----------------------|---------------------|-------------------------|
| Pads                 | 2 (4%)              | 8 (16%)                 |
| Washed clothes       | 21 (42%)            | 19 (38%)                |
| Used clothes         | 27 (54%)            | 23 (46%)                |

Incidence of RTI noted to be highest in females with usage of used cloth during menstruation. The resulting infections are due to overgrowth of normal vaginal flora, resulting from unhygienic practices, majority being illiterate in our study, causing local as well as ascending infection including PID.

**Table 7: Predisposing factors**

| Predisposing factors          | Pregnant N = 50 | Non pregnant N = 50 |
|-------------------------------|-----------------|---------------------|
| Diabetes                      | 2               | 1                   |
| Thyroid                       | 0               | 1                   |
| HIV                           | 3               | 2                   |
| Anemia (<7mg%)                | 4               | 3                   |
| Past Abortion treated at home | 20              | 19                  |

Maximum contribution was by previous abortion managed at home (20 cases in pregnant and 19 in non pregnant). Decreasing immunity is an important factor in predisposition to RTI. Those with post abortions managed at home were at high risk since genital defences get weak.

Amongst the pregnant women, maximum number of infections were noticed with non users(51%) or with those who used oral pills (28%). Condoms were proven to be protective in pregnant women. Among non pregnant, maximum number was present in IUD users(47%).

More chances of RTI were noted in females with one or more abortions.

The incidence of RTI was only slightly different in Hindus and Muslims. This was statistically not significant (p<0.05).

Majority of the women, 80% pregnant and 78% non pregnant, were housewives, although no significant difference of RTI with occupational status noted amongst pregnant or non pregnant women.

In our study, majority were illiterate, 60% in pregnant and 45% in non pregnant.

**SUMMARY**

1. Majority of the infections belonged to age group 26-34 years (72% in the pregnant and 46% in non pregnant) because these are the most sexually active women. RTI infections being more common in pregnant females of 26-34 years as compared to non pregnant.
2. No association (P>0.05) is observed between age at marriage and presence of RTI in women with pregnancy status. It was observed that maximum number of women have RTI with marriage at age less than 18 years showing 86% in pregnant and 70% in non pregnant women.
3. Prevalence of RTI was more in married females who were pregnant as compared to non pregnant.

4. Commonest symptom of RTI/STI was vaginal discharge (96% in pregnant and 88% in non pregnant women), followed by lower abdominal pain (74% in pregnant and 64% in non pregnant).
5. Endogenous infections were more prevalent among pregnant women (70%). Out of them, most prevalent was candidiasis (50%), followed by bacterial vaginosis (20%). STI was less except Trichomoniasis (10%), Hepatitis B (6%), HIV (6%). But majority had bacterial vaginosis (46%) in non pregnant followed by candidiasis (32%).
6. More chances of RTI symptoms noted in females with one or more than abortion, pregnant and non pregnant, more with cases who were managed post abortally at home.
7. Incidence of RTI noted to be highest in females with usage of used cloth during menstruation (53% in pregnant and 46% in non pregnant).
8. Immunocompromised were noted to be more predisposed to infection amongst pregnant 6% with HIV, 8% with anemia, 4% with diabetes.

**CONCLUSIONS AND RECOMMENDATIONS**

Following the prospective study of RTI in 50 pregnant and non pregnant women, it can be concluded that majority of women with RTI belonged to age group of 26-34 years, had an early marriage, with one or more abortion, lack of reproductive hygiene and who were poorly nourished and immunocompromised.

This has given enough evidence to provide reproductive health and family welfare services to these vulnerable females and attempt to-

- Improving nutritional status through national health programmes and educate adolescent girl.
- Routine screening of antenatal women for RTI/STI.
- Diagnosis and treatment for RTI/STI based on syndromic management.
- Promotion and training in conducting simple laboratory tests to diagnose endogenous infections at all health care levels.
- Promotion of contraceptive method and awareness of family planning.

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