

Title of the Thesis:

AN EPIDEMIOLOGICAL STUDY ON RTI/STI AMONG WOMEN OF REPRODUCTIVE AGE GROUP IN URBAN SLUMS OF BRAHMAPUR CITY

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ABBREVIATIONS

AIDS	Acquired Immunodeficiency Syndrome
AWC	Anganwadi Centre
AWW	Anganwadi worker
CDPO	Child Development Project Officer
CPI	Consumer Price Index
DALY	Disability Adjusted Life Years
FHAC	Family Health Awareness Campaign
HIV	Human Immunodeficiency virus
H/O	History of
HPV	Human papilloma virus
ICDS	Integrated child development sceme
ICPD	International Conference on Population and Development
IUGR	Intrauterine growth retardation
PID	Pelvic inflammatory disease
RCH	Reproductive and Child health
RTI/STI	Reproductive tract infection/ Sexually transmitted infection
SEBC	Socially and Educationally Backward Class
STD	Sexually transmitted disease
VCTC	Voluntary Counseling and Testing Centre
VDRL	Venereal Disease Research Laboratory
WHO	World Health Organization

INTRODUCTION

“The enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being without distinction of race, religion, political belief, economic or social condition.” This means that every human being has the right to live in an environment with minimum health risks, and to have access to health services that can prevent or alleviate their suffering, treat disease, and help maintain and promote good health throughout the individual’s life. Many women, wherever they live in the world, are being denied this basic human right.¹

The issues related to women’s health are utmost importance because this segment of population contributes most significantly towards the quality of nation’s human resources and its future. It is now accepted that women’s health status has an important impact on the health of their children, the family, the community and the environment. And yet, despite these assertions, and despite the rapid technological advances that have been made in a number of fields, many women still suffer from preventable morbidity and mortality. While some improvements have been recorded in physical quality-of-life indicators, the health status of women remains precarious and, in some situations it is worsening.¹

Health cannot be attained where poverty and misery abound, where food and safe water are scarce, where housing is inadequate, and where public and community services are lacking or rudimentary.² Low education, lack of awareness and poor health

care seeking behaviour of slum women adds to this condition. Thus the health situation of women in reproductive age group in the urban slums needs much attention.

Nehru was of the opinion that the urban life produces an unstable society, which gradually loses its vitality.³ The condition of the urban slum is even worse.

As defined by the WHO and adopted in 1994 in the International Conference on Population and Development (ICPD, Cairo), Programme of Action, Reproductive health is a state of complete physical, mental and social well being, and not merely the absence of disease or infirmity in all the matters relating to the reproductive system and its functions and processes.⁴ The ICPD at Cairo (1994) has recommended a new approach i.e. Reproductive health approach to tackle the problems of population and health and development of women and children. As a follow up action to this conference, the Govt. of India launched the Reproductive and Child Health (RCH) Programme in October 1997.⁵

Reproductive and Child Health approach has been defined as “people have the ability to reproduce and regulate their fertility; women are able to go through pregnancy and child birth safely, the outcome of pregnancy is successful in terms of maternal and infant survival and well being; and couples are able to have sexual relations free of the fear of pregnancy and contract diseases”.⁶ This approach extends beyond the narrow confines of family planning to encompass all aspects of human sexuality and reproductive health needs during the various stages of life cycle.

The RCH programme incorporates the components covered under the child survival and safe motherhood programme and includes additional components related to sexually transmitted disease (STD) and reproductive tract infection (RTI).⁷

The control of reproductive tract infections (RTIs), especially sexually transmitted infections (STIs), is an urgent health priority in many countries.⁸ Globally WHO estimates that reproductive ill health accounts for 36.6% of the total disease burden in women as compared to 12.3% for men of the same age.⁹ In 1990 the Global Burden of Disease study, using a narrow subset of possible reproductive morbidities, estimated that 21.9% of the DALYs lost by women aged 15-44 years were attributable to reproductive ill health.¹⁰ The annual incidence of RTI/STI in India is estimated at 5% or approximately 40 million new infections occurring every year.¹¹ National Family Health Survey-2 has also reported that 39.2% women in India have one or more reproductive infections.¹²

Although early detection and treatment of STDs can prevent complications and minimize the severity of long-term sequelae, many infections go untreated. Cultural barriers as well as poor understanding of the significance of symptoms may also reduce care-seeking by women.¹³ Since a large proportion of women suffer morbidity silently, and are reluctant to seek care, it is difficult to assess the true magnitude of the problem or the patterns of morbidity from which women suffer. Ultimately this leads to complicating the situation even worse.

RTI/STI as a community health problem needs exploration in different strata and risk areas to understand the extent, pattern and community behaviour of the disorder. Studies on prevalence of RTI/STI were not conducted widely in India so also Orissa and Ganjam district. So an attempt was carried out in Brahmapur to focus on the extent of such reproductive health problem in the women of urban slums.



REVIEW OF LITERATURE

“Reproductive health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity, in all matters relating to the reproductive system and to its functions and processes at all stages of life. Reproductive health therefore implies that people are able to have a responsible, satisfying and safe sex life and that they have the capability to reproduce and the freedom to decide if, when and how often to do so. Implicit in this last condition is the right of men and women to be informed and to have access to safe, effective, affordable and acceptable methods of fertility regulation of their choice, and the right of access to appropriate health-care services that will enable women to go safely through pregnancy and childbirth and provide couples with the best chance of having a healthy infant.”- defined by WHO¹⁴. It refers to a spectrum of conditions, events and processes throughout life, ranging from healthy sexual development and maturation, responsible relationship and joys of child bearing to abuse, violence, illness, disease, disability and death. In 1994, at the International Conference on Population and Development (ICPD) in Cairo, 165 nations endorsed the above definition of reproductive health.

The ability of all people, especially women, to achieve reproductive health is an integral part of their reproductive rights. Everywhere sexuality and sexual behaviour have profound consequence on individuals, families and societies. Our knowledge of the negative consequences of sexual relationship is incomplete, but estimates of reproductive ill health worldwide indicate an unacceptable high prevalence of preventable conditions, unnecessary suffering and often devastating consequences for individuals and families.

Women bear most of the responsibility in sexuality and reproduction through contraceptive use, pregnancy, childbirth and lactation. They also bear most reproductive ill health, in part because many do not have control over their sexual lives or have access to their services and information they need. But successful strategies to improve sexual and reproductive health must involve men, taking into account their roles and responsibility, and their needs and concerns, in sexuality and reproduction.¹⁵

Females are being discriminated and disadvantaged right from the intra-uterine life and through infancy, childhood, and adolescence and adult life.⁴ Their chains are those of lack of education and access to fertility control, and of prejudice, discrimination and economic dependence. She will often have lower status in the household, lower status in the work place and less opportunity for education, training, employment and inheritance rights, all of which make for greater vulnerability.¹⁶

Globally WHO estimates that reproductive ill health accounts for 36.6% of the total disease burden in women as compared to 12.3% for men of the same age.⁹ The burden of RTIs particularly STDs falls most heavily on women of reproductive age group and the term RTIs is invariably used to refer to infections among women.¹⁷ STDs are now the commonest group of notifiable infectitious diseases in most countries. Despite some fluctuations their incidence remains unacceptably high.¹⁸

Reproductive tract infections (RTIs) encompass three main groups of infection in women:¹⁹

1. Endogenous infections of the female genital tract- such as Candida or bacterial vaginosis.
2. Sexually transmitted infections (STIs).

3. Iatrogenic infections, acquired, for example, through unsterile procedures across the cervix, such as insertion of an intrauterine device, menstrual regulation or termination of a pregnancy.

Sexually transmitted diseases (STD) are a group of communicable diseases that are transmitted predominantly by sexual contact and caused by a wide range of bacterial, viral, protozoal and fungal agents and ectoparasites.²⁰ The WHO recommends that the term Sexually transmitted diseases (STD) be replaced by the term sexually transmitted infection (STI). This term has been adopted since 1999 as it better incorporates asymptomatic infections.²¹

Many health care facilities in developing countries lack the equipment and trained personnel required for etiological diagnosis of STIs. To overcome this problem a syndrome-based approach to the management of STI patients has been developed and promoted in a large number of countries in the developing world.¹⁰ As with most clinical symptoms and signs, RTIs can present in a variety of ways, but some presentations which are found more commonly have been grouped into syndromes. Screening of RTI/STI is based on identifying groups of easily recognized signs and symptoms (syndromes).

Symptoms of RTI/STIs can appear anywhere from 2-3 days up to several months and even years after having sex with infected partner. Some men and women with RTI/STI may be asymptomatic or have minimal discomfort and so do not seek health care. The common signs and symptoms of RTI/STI in women are as follows:²²

1. Vaginal discharge which look and smell differently from the usual discharge.
2. Genital ulcers

3. Lower abdominal pain in women can be pelvic inflammatory diseases (PID)
4. Inguinal bubo: This is a common symptom of RTI/STI, which is often associated with genital ulcers.

MAGNITUDE OF THE PROBLEM:

Global Scenario:

The worldwide spread of sexually transmitted diseases has been one of the major disappointments in public health in the past two decades.²³

RTI/STI is projecting as major public health challenge in RCH not only in India but all over the world. WHO estimates that between 150 and 330 million new cases of curable STDs occur worldwide.²⁴

RTIs are a global health problem especially in resource poor settings of the world. Studies amongst women in India, Bangladesh, Egypt and Kenya have found RTI prevalence rates ranging from 52 to 92% and fewer than half amongst these women recognized the condition as abnormal.¹⁷

It is estimated globally in 1995 there were approximately 333 million new cases of the 4 major curable STIs (gonorrhoea, chlamydia, syphilis and trichomoniasis) in the 15-49 years old.²²

India:

Based on a number of prevalence surveys, the annual incidence of RTI/STI in India is estimated at 5% or approximately 40 million new infections takes place every year.¹⁷

Sexually transmitted diseases (STDs) are major public health problem the world over and India is no exception. It is virtually impossible to assess the magnitude of the problem in India due to lack of reliable data and gross under-reporting. It is estimated that more than 40 million cases are reported as new cases every year and as many as 1 or 2 women in every ten are infected with an STD. It is probably more prevalent communicable disease in India.²⁵

Orissa:

There are very few studies on RTI/STI in Orissa. In a study conducted by Sarangi L. et al in Sundargarh district of Orissa, prevalence of RTIs/ STDs found to be 39.2% with rural prevalence higher 44% than urban 32%

ETIOLOGY OF RTI/STI:

There are over 30 identified organisms which can infect the reproductive tract.¹⁹

Viruses:

Herpes simplex viruses, Human papilloma virus, Molluscum contagiosum, Hepatitis viruses, Cytomegalovirus, Human immunodeficiency viruses, Human T Lymphotropic viruses.

Bacteria:

Chlamydia trachomatis, Neisseria gonorrhoeae, Gardnerella vaginalis, Treponema pallidum, Haemophilus ducreyi, Ureaplasma urealyticum

Protozoa:

Entamoeba histolytica, Trichomonas vaginalis, Giardia lamblia

Mycoplasmas:

Ureaplasma urealyticum, Mycoplasma hominis

Parasites:

Sarcoptes scabiei, Phthirus pubis

Fungi:

Candida albicans

Agents causing common syndromes :**Vaginal discharge:**

Chlamydia trachomatis, Neisseria gonorrhoeae, Trichomonas vaginalis, Candida, Organisms of bacterial vaginosis, Beta Haemolytic streptococcus, Cervical lesions-
chancres, herpes

Genital ulcers:

Treponema pallidum, Haemophilus ducreyi, Herpes simplex viruses, Calymmatobacterium granulomatis (donovanosis)

Lower abdominal pain:

Chlamydia trachomatis, Neisseria gonorrhoeae, Organisms of bacterial vaginosis

Inguinal bubo:

Chlamydia trachomatis (lymphogranuloma venereum).

The following are WHO estimates of minimum yearly number of new cases of major bacterial STDs.²³

Gonorrhoea – 25 million

Genital Chlamydial infections –50 million

Infectitious syphilis – 3.5 million

Chacroid – 2 million

Genital herpes – 20 million

Genital HPV infection – 30 million

Trichomoniasis – 120 million

In a community study from India, **Bang RA et al** (1989) reported that 11% had syphilis, 0.3% had gonorrhoea, 14% had trichomonal vaginitis, 62% had bacterial vaginosis, 34% had candida vaginitis and 24% had pelvic inflammatory disease.²⁶ According to **Toppo M. et al** (1996-97), in females maximum suffering from Syphilis i.e. 26%, PID (20.4%), Trichomoniasis (17.3%), followed by gonorrhoea 11.5% and candidiasis 11.6%.²⁷ **Garcia P. et al** (1997-98) in their study in Peru observed Bacterial vaginosis (43.7%) Trichomoniasis (16.5%), vulvovaginal candidiasis (4.5%), Chlamydial infection (6.8%), gonorrhoea (1.2%), syphilis (1.7%), cervical HPV (4.9%) and genital warts or ulcers (2.8%).²⁸ **Thakor H.G. et al** in their study in 2000 found that prevalence of syphilis was 22.7%, Gonococcal infection 16.9%, Chlamydia 8.5% and Trichomonal infection 14.4% in sex workers.²⁹ **Pawanarkar J. and Chopra K.** (2001-2002) in their study found Bacterial vaginosis (63.3%) to be most common followed by candidiasis (25%) and Trichomonal vaginitis (11.7%).³⁰

Barbin L. et al (1993-95) in their study in Mumbai found vaginal discharge and pain during intercourse were common symptoms (21.7% and 26.4%).³¹ In a study on RTI/

STDs by **Nandan D. et al** (1997-98), reported, commonest symptom of RTIs/STDs was vaginal discharge (94%) followed by lower abdominal pain (55%).³² According to **Srivastava A. et al**, vaginal discharge was found 54.78% in rural, 43.48% in urban and 43.48% in urban slums with an average of 47.24% in all 3 areas.³³ **Garcia P. et al** (1997-98) in their study in Peru found prevalence of RTIs to be 77% of which lower abdominal pain 29.3% followed by abnormal vaginal discharge 22.9%.²⁸ According to **Thakor H.G. et al**, (2000) most common syndromic diagnosis was genital discharge syndrome- GDS (51.3%), followed by pain in lower abdomen (20.2%), enlarged inguinal lymph nodes (11.8%) and genital ulcer syndrome GUS (5.9%).²⁹ **Pawanarkar J. and Chopra K.** (2001-02) found vaginal discharge to be more common prevalence (62.1%) in women who were infertile, amongst them 55.6% were proved to having RTIs.³⁰

DETERMINANTS OF REPRODUCTIVE HEALTH:

The reasons for high incidence of RTIs/STIs, especially in developing countries, should be sought in a number of variables, in particular urbanization, unemployment, economic hardship, and a relaxation of traditional restraints on sexual activity, as well as the emergence of antibiotic-resistant strains of microorganisms.²³

Reproductive health and health in general, is predetermined by the socioeconomic conditions in the society in which people are born and in which they live. It is promoted or undermined by the individual's own lifestyle, and it is improved by health care services and information and technological advances made through health research. The determinants are inter-related. Their relative importance varies for different health conditions.²³

Socioeconomic conditions:

Pregnant women and children suffer first and most under poor socioeconomic conditions. In fact, the parameters of reproductive health, such as maternal mortality, infant mortality, and low birth weight, are sensitive indicators of the level of socioeconomic development in any country.

Poverty – Economic growth is essential for human development, but to exploit fully the opportunities for improved well being that growth offers, it needs to be properly managed. Some developing countries have been very successful in managing their growth to improve human conditions.

In a study by **Parashar A. et al** (1999) in Shimla found a significant association between RTI and per capita monthly income, more (69.2%) in respondents belonging to Class IV of Prasad's classification.³⁰ **Pawanarkar J. and Chopra K.** (2001-02) reported higher prevalence of RTIs in women of lower strata of society (36%) compared to women from middle and higher income groups respectively.

Nutrition – The effect of food shortage is often felt first and most by women and children.

Status of women – A woman's status in society and her reproductive health are intricately intertwined in a twoway relationship. Overall, reproductive health but in particular the ability to regulate and control fertility, has an impact on the status of woman. The reverse is also true, i.e., the status of a woman has an impact on her reproductive health. In societies where a woman's "value" is based on number of children she has, her ability to regulate and control her fertility will be limited. In general, educated

women use health care services much more than illiterate women. Research has consistently shown that women's education is strongly linked to better reproductive health, including infant survival and healthy growth of children.¹³

Rathore M. et al (2000) found 29.5% women with RTI/STI were of illiterate group, while only 7.3% were having secondary & higher secondary education.³⁵ Higher prevalence found in women who were illiterate (42.9%) as compared to women educated up to middle level (4.6%).³⁰

Lifestyles – An individual's behaviour or lifestyle is an important determinant of his or her health (including reproductive health).

Sexual behaviour – The “sexual revolution” of the last 25 years in developed countries and in some developing countries has contributed significantly to the increase in the incidence of sexually transmitted diseases, including AIDS.²³ Risky sexual behaviour like early sexual debut and multiple partners are associated with RTI/STI.¹⁷

The treatable STDs, such as syphilis, gonorrhoea, and chancroid, are increasingly concentrated in “core populations” and increasingly affect prostitutes and their sexual partners as well as persons involved in the use of illicit drugs, particularly crack cocaine. Members of these core populations have been difficult to reach for the purpose of education and contact tracing and may continue to be sexually active despite STD symptoms. Other STDs are more evenly distributed in society. For example, in the absence of diagnostic testing and partner treatment, chlamydial infections can persist for many months (often asymptotically) and can be propagated widely in populations that do not share all of the characteristics of core groups associated with gonorrhoea, syphilis,

chancroid, or HIV infection. Similarly genital HPV infection is incurable and therefore persists and spreads efficiently in relatively low risk populations.³⁶

In a study by **Chaubey D. et al** (1993), they found that, a large majority (68.7%) of STD patients had their first sexual experience before the age of 20 years. Pre-marital and extra-marital sexual contacts were significantly higher in STD patients as compared to controls (74.7% and 87.5% in STD group and 35.0% and 20.5% in controls respectively. They observed, a very large proportion (76.6%) of STD patients had multiple sexual contacts as compared to only 16% in controls.³⁷ **Hawkes S. et al** (1995) in rural Bangladesh observed 15.4% of women with symptomatic husband had RTI/STI compared to 1.45% of women whose husband were having no symptoms.³⁸

Health seeking behaviour – Health related behaviour are also crucial component of personal environmental factors affecting RTI transmission patterns. Early health care utilization, compliance with therapy, provider screening primarily affect distribution of curative RTIs, by reducing duration of infectiousness and by preventing long term complications. Other behaviours such as contraceptive use, vaginal douching and circumcision may affect patterns more broadly.¹⁷

Factors such as personal hygiene and sexual behaviour, which affect the vaginal environment, may be important. In a study by **Parashar A. et al** (1999) in Shimla, they found, the prevalence of RTIs was significantly high ($p < 0.001$) in those who were using any type of cloth whether clean or unclean.³⁰ In the study by **Hawkes S et al** (1995), endogenous infections were found more commonly among Hindu than Muslim women. Whereas 31% of Muslim women changed their sanitary protection more than three times a day, only 15% of Hindu women did so ($P < 0.001$).³⁸ They reported the prevalence of

RTI/STI was 50% in IUCD users.³⁸ **Parashar A. et al** reported RTI prevalence to be 50.6% of terminal method users and 45.6% of IUD users and significantly low prevalence in women who use barrier methods.³⁰

Changing social structure - Changing social structures and erosion of traditional social institutions on account of urbanization and male migration results in risky behaviour. Mushrooming growth of slum settlements in cities and in vicinity of industries is also conducive for rapid spread of these infections.

Rathore M. et al (2000) in their study found, women from nuclear families had more RTI (26.6%) than joint families (17.1%).³⁵ **Ram R. et al** (1999) in their study, reported prevalence of RTI to be minimum in small sized family and it gradually increases with the increase in the number of family members.³⁹ According to **Hawkes S. et al** (1995), RTI/STI prevalence was maximum in women working outside home and 4.8% in housewives.³⁸

Age - The population distribution by age in developing countries is such that there are large numbers of people in the age group, which is sexually most active which favours increasing incidence of STDs.²³

STDs have become the most common group of notifiable diseases in most countries, particularly in the age group of 15- 50 years.²³ **Wilkinson D. et al** (1996-97) in their study in South Africa estimated the point prevalence of STI to be 24.9% and highest prevalence in the age group of 15-29 years.⁴⁰ According to **Nandan D. et al** (1997-98), approximately half of the symptom positive women (48%) were in the age group of 25-34 years both in rural (49%) and urban areas (47%).³² **Thakor H.G. et al** (2000) in their study found that 45.8% of sex workers having STIs were more than 25 years.²⁹ In the

study of **Pawanarkar J. and Chopra K.** (2002), RTIs were more prevalent in the age group of 26-30 years (33.9%).³⁰ **Rathore M. et al** (2000) observed an increasing trend in RTIs with increase in age, ranging from 1.7% to 44.7% ($P < 0.0001$).³⁵

Marital status - **Parashar A. et al** (1999) reported RTIs in 69.2% of married females against 2.5% of unmarried females.³⁰ **Rathore M. et al** (2000) found only 1% of unmarried women had RTIs against 27.9% of married women ($P < 0.0001$).³⁵ In the same study by **Parashar A. et al**, most of the cases had married at age < 15 years and a significant decrease in the prevalence as the age at marriage advanced.³⁰

Parity – **Rathore M. et al** (2000) found lowest prevalence of RTIs was in nullipara ($P < 0.001$) and highest (44.9%) in grand multipara ($P < 0.001$).³⁵ **Nandan D. et al** (1997-98) in their study found maximum prevalence (32%) in women having one or two children in urban area.³² In the study by **Parashar A. et al** (1999), maximum number of cases were found in women with parity 4 (64.7%) followed by parity 6 and 5.³⁰

RTIs contribute significantly to the burden of reproductive morbidity in poor women. RTIs may be sexually transmitted or may be due to the overgrowth of organism normally resident in the reproductive tract. Women are more likely than men to develop RTIs and are also at higher risk of experiencing severe health consequences of RTIs. This may be due to several reasons. For anatomic or physiologic reasons, for example, women appear to be intrinsically more susceptible to genital cancers complicating HPV infection, to upper genital tract infections, and to puerperal complications. Furthermore, early in the course, women are more likely than men to have subclinical infections or minor, nonspecific symptoms - a situation that can result in delayed diagnosis. The lesser

specificity of clinical findings and the lesser sensitivity of several microbiologic tests in women than men make the diagnosis of STDs more difficult in women.³⁶

PATHOPHYSIOLOGY:

Various STDs differ in the extent to which their spread and persistence in the population depend on high rates of sexual partner change. In general, the initial rate of spread of any STD pathogen within a population depends on the product of three factors: rate of exposure, efficiency of transmission per exposure, and duration of infectivity of those infected. For any given sexually transmitted infection, Anderson and May express this idea as $R_0 = c \times B \times D$, where R_0 represents the “reproductive rate” of a pathogen (i.e., the average number of new secondary cases arising from an infected person); c reflects the average rate and variance in the rate of partner change in the population and patterns of partner mixing; B represents the average efficiency of transmission per exposure of a susceptible person to an infected person; and D is the mean duration of infectivity for infected persons. For diseases with a high efficiency of transmission and/ or a long duration of infectiousness, rates of partner change need not be very high to sustain an epidemic. For STDs with a low efficiency of transmission (e.g., HIV infection) or a short duration of infectiousness (e.g., chancroid), high rates of partner change may be necessary to sustain an epidemic.³⁶

Bacterial Vaginosis - The concentration of *Gardenerella vaginalis* and anaerobes are increased whereas the concentration of lactobacillus, which may act as a non-specific defence mechanism of the vaginal ecosystem is decreased.¹⁷ Many epithelial cells present a granular cytoplasm caused by small Gram-negative bacilli adhering on their surface which are called clue cells.⁴¹

Candidiasis – It is caused by a Gram-positive fungus, *Candida albicans*, which thrives in an acidic medium with an abundant supply of carbohydrates. It is found commonly in pregnancy, and in patients on oral contraceptives, antibiotics and corticosteroids. It is also seen in patients with diabetes.⁴¹

Trichomoniasis – Acute or chronic vaginal infections caused by a protozoan *Trichomonas vaginalis*. These infections typically underlies vaginal and cervical mucosa has a characteristic fiery red appearance, called strawberry cervix.⁴¹

Gonorrhoea – The vaginal squamous epithelium in the adult female is resistant to gonococcal infection. The organism penetrates the columnar epithelium of the glands of Skene and Bartholin, part of urethra and the urethral glands, the cervix and fallopian tubes, producing a marked polymorphonuclear response in the tissues. The infection spreads along the mucous membrane to affect the cervix, endometrium and the fallopian tubes.⁴¹

Chlamydia – *Chlamydia trachomatis* is a small obligate intracellular bacterium that appears as intracytoplasmic inclusion body, and is of two varieties, one that causes lymphogranuloma venereum (LGV) and the other of non-LGV, which causes nonspecific lower genital tract infection.⁴¹

Syphilis – Caused by *Treponema pallidum*, transmitted by direct contact. The primary lesion or chancre develops in 10-90 days after infection. The typical primary lesion is circular and indurated, with eroded base and there is a marked oedema of the surrounding tissues. It may develop on the labia majora or minora, at the fourchette, near the external urinary meatus, on the clitoris or on the cervix. Superficial inguinal lymphadenopathy with discrete or rubbery glands also develop.¹⁷

Chancroid – Also called soft sore, caused by *Haemophilus ducreyi*. It results in painful tender genital ulcers following a vesicopustule on the perineum, vagina or cervix. Inguinal bubos with oedema may develop.⁴¹

Genital Herpes – It is caused by Herpes simplex virus II. Initial infection at a skin or mucosal site on vulva, vagina and occasionally cervix results in formation of vesicles that progress to shallow painful ulcers.¹⁷

CLINICAL FEATURES:

Bacterial Vaginosis – Some women are asymptomatic carriers of infection, but majority complain of vaginal discharge which has a “musty” or fishy odor but minimal or no vulval irritation.⁴¹

Candidiasis – This is manifested by vulval or vaginal pruritus, the presence of white clumpy discharge that clings to the vaginal wall, and erythma.¹⁷

Trichomoniasis – Characterised by vaginal discharge which is profuse, thin, creamy or slightly green in colour, irritating and frothy.⁴¹ Signs and symptoms of erythma, oedema, a foul odour, and pruritus of the external genitalia will also be present.¹⁷

Gonorrhoea – This may be associated with a vaginal discharge and dysuria. However approximately 20-50% of all infected women are asymptomatic.⁶ Infection may ascend and cause cervicitis and PID.⁴¹

Chlamydia – Often, the woman is asymptomatic but may develop vaginal discharge, dysuria and frequency of micturation and at times cervicitis. Ascending infection may cause PID & infertility.⁴¹

Syphilis – The initial lesion (chancre) is the prominent feature of primary syphilis and usually appears at the site of infection two to six weeks after exposure. The chancre is usually painless.¹⁷ The chancre persists for 1-5 weeks and then heals spontaneously.

In secondary syphilis, generalized skin eruptions, fever, popular lesions covered with scales or sodden white areas appear on the vulva. In the perianal region hypertrophic flat-topped condylomas may be seen later and these may spread to the vulva and the thighs. These lesions may also fuse to form large plaques and very infectious. This stage lasts for 2-10 weeks. In late syphilis, gummatous lesions of skin or mucous membranes may occur but rarely seen on the genitalia.⁴¹

Chancroid – Painful tender genital ulcers is the characteristic presentation.⁴¹ A tender bump appears approximately 4-7 days after exposure to *H. ducreyi*, becomes pus-filled, and then erodes to form a painful ulcer one or two days later. Multiple lesions located at the entrance of the vagina are the most common presentation in women.⁶ The lesions also appears on perineum, vagina, cervix and may be associated heavy, foul discharge.⁴¹

Genital Herpes – The incubation period is 3-6 days. The infected partner may remain asymptomatic, but often complains of tingling and burning in the anogenital area. The vesicles appear on the erythematous base on the vulva, vagina and occasionally cervix. These soon rupture leaving multiple shallow ulcers, which are painful following secondary bacterial infection. The patient suffers from fever, malaise and headache. Spontaneous healing of ulcers without scarring occurs in about 14-21 days. Inguinal lymph nodes enlarge and become tender. Recurrent vaginal herpes is common, but is less severe and lasts for a shorter period than primary attack.⁴¹

According to a study by **Rathore M. et al** (2000), PID was the commonest RTI (15.7%), followed by vaginitis (11.3%), whereas, cervicitis and cervical erosion were 4.2% and only 0.2% women had genital ulcer.³⁵

SYNDROMES:

VAGINAL DISCHARGE:

It is a common complaint in women. It may be caused by any of the following conditions:⁵

- 1. Physiological:** During ovulation, just before menstruation or during or during pregnancy. At these times the discharge is mucoid, not blood stained, or foul smelling and not associated with itching of vulva.
- 2. Candidial infection (thrush):** This appears as curdlike, white patches on the vaginal mucosa accompanied by thick, curdy white discharge and itching at the vulva. This infection occurs commonly during pregnancy.
- 3. Parasitic infestation (Trichomonal vaginitis):** This may be transmitted during sexual intercourse or by contact with contaminated articles. It is characterized by greenish yellow, frothy, foul smelling discharge accompanied by itching and redness of the genital area.
- 4. Gonorrhoea:** This is a sexually transmitted disease. In women it is characterized by purulent discharge from cervix and urethra but this may be mild and may pass unnoticed. These women may develop salpingitis at a later stage and may complain of pain in the lower abdomen and fever. Untreated gonorrhoea may result in infertility in women.

5. Puerpera/ Postabortal sepsis: This is an infection of the genital tract, which occurs following delivery or after an abortion. It can be prevented by taking proper aseptic precautions during delivery/ abortion. Puerperal sepsis is characterized by high fever, headache, low abdominal pain and foul smelling, purulent vaginal discharge.

6. Following IUD insertion: This may be found quite often. The discharge is profuse and watery and usually subsides after the first menstrual period following insertion.

In a study by **Srivastava A. et al**, maximum women were having watery discharge (64.08%) followed by curdy discharge (29.13%). The discharge was offensive in only 1.94% cases and 4.85% women had mixed discharge.³³

GENITAL ULCERS:

An ulcer is a break in the continuity of skin or mucous membrane, which occurs in the external genital due to RTI/STI. The most common STI presenting with genital ulcer are syphilis, chancroid and genital herpes.⁴²

LOWER ABDOMINAL PAIN:

Lower abdominal pain in women is often presenting feature of women with pelvic inflammatory diseases (PID). PID is defined as an infection of the female genital tract above the cervix and may include endometritis, salpingitis, tubo-ovarian abscess and peritonitis. PID occurs as a result of ascending infection from the cervix and is caused by *N. gonorrhoeae*, *C. trachomatis* and anaerobic bacteria. Infertility due to tubal occlusion and ectopic pregnancy are serious complications of PID.⁴²

INGUINAL BUBO:

Inguinal bubo is a painful swelling of the lymphnodes in the inguinal region resulting from any kind of acute infection of skin on the pubic area, genitals, buttocks,

anus, thighs, legs, feet and toes. This is a common symptom of RTI/STI which is often associated with genital ulcers.²² A bubo may occur in chancroid or lymphogranuloma venereum.⁴²

COMPLICATIONS AND SEQUELAE:

By definition STDs affect both men and women. However, as is generally the case with reproductive health, STDs have more serious sequelae in women than men. In women, the lesions often occur in the inner genitalia, and are thus hidden and quite often remain asymptomatic. Moreover, chronic ascending infection in women has much more serious consequences and is more likely to lead to pelvic inflammatory disease, higher risk of pregnancy, and permanent infertility. Even cancer of cervix can be a late sequela.¹⁴

RTI/STDs take their greatest toll through their sequelae-conditions resulting from the spread of STD pathogens from the point of infection to another part of the reproductive tract or another part of the body.¹⁷

Infertility:

This results from from scarring of the fallopian tube, following ascent of gonorrhoea, chlamydia and possibly bacterial vaginosis organisms to the upper genital tract which cause pelvic inflammatory disease. RTIs cause a heavy emotional burden, especially when they damage fertility.¹⁷

Ectopic Pregnancy:

This follows incomplete occlusion of the tubal lumen. In situations where RTIs are common and the access to health services limited, it is quite likely that both the incidence of extra uterine pregnancies and case fatality ratio is higher.¹⁷

Cervical cancer:

Cervical cancer is the most common cancer among women in the third world. Although questions regarding mechanism by which HPV virus causes cervical cancer remain unanswered, available evidence suggest that HPV infections play a major role in causation of cervical cancer throughout the world.¹⁷

Adverse outcomes of Pregnancy:

Poor pregnancy outcomes linked to RTIs include foetal wastage (spontaneous abortions and still births), low birth weight (premature delivery or IUGR) and congenital or perinatal infections (including potentially blinding eye infections, infant pneumonia and mental retardation). As such the impact of RTIs on pregnancy outcome depends upon the organism involved, the chronicity of infection, and the stage of gestation during which women becomes infected.¹⁷

HIV transmission:

Presence of STIs has been found to facilitate the acquisition and transmission of HIV infection. A 10-fold risk of transmission is associated with infections that cause genital ulceration. Available evidence indicates that with non-ulcerative infection risk of the transmission is up by at least 4 fold. Furthermore, preliminary data suggest that at community level HIV infection may also increase prevalence of STDs.¹⁷

LABORATORY DIAGNOSIS:**Whiff test:**

Addition of 10% KOH to the vaginal smear releases fishy amine odour which is the characteristic of bacterial vaginosis.⁵

Direct microscopic examination of a wet mount:

Saline wet mount can be done to identify motile trichomonas, budding yeast cells and clue cells.⁵

Direct microscopy with Gram's staining:

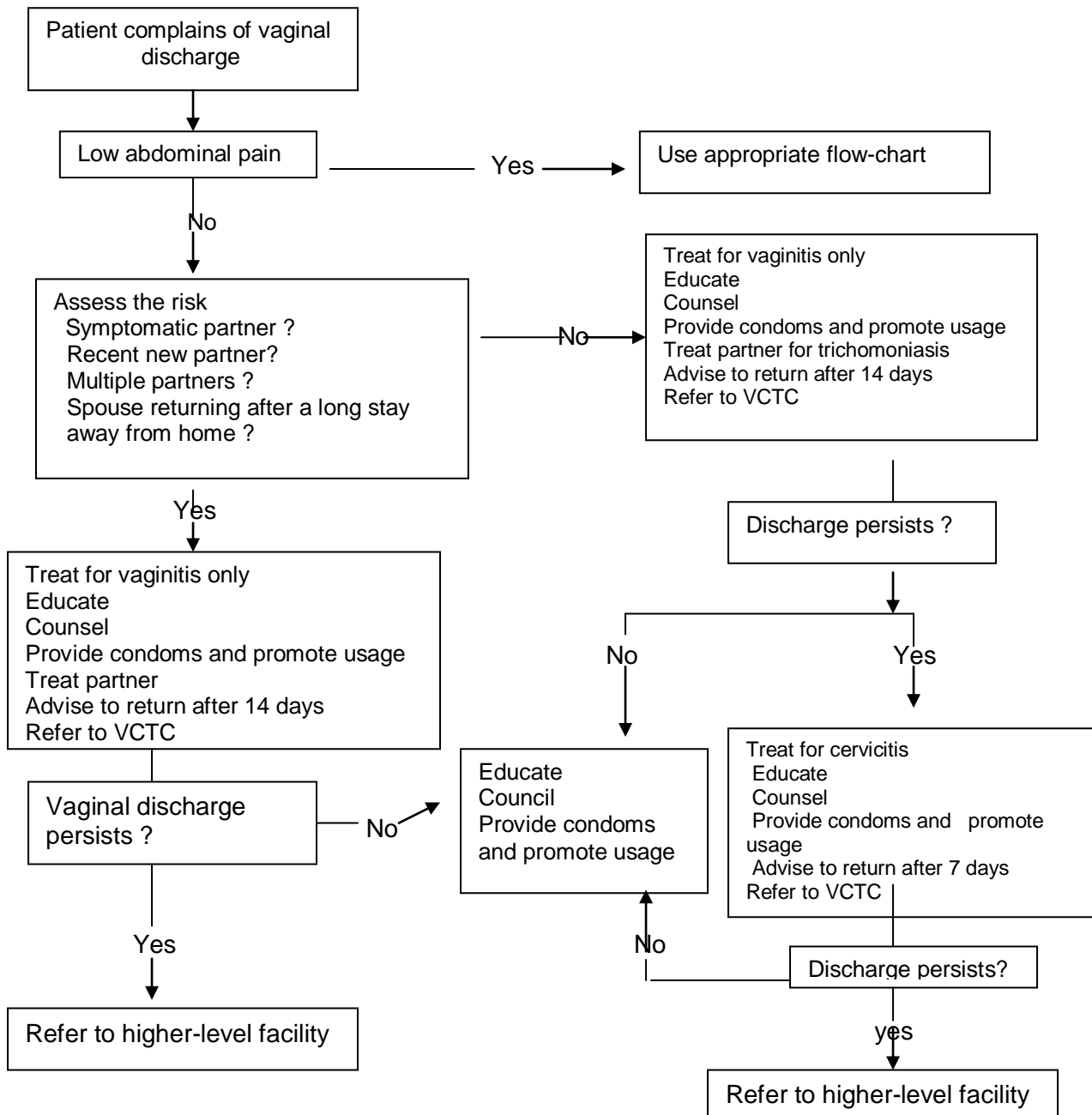
After Gram's staining, slides examined under oil immersion lens to see diplococci, budding yeast cells and clue cells.⁵

VDRL test:

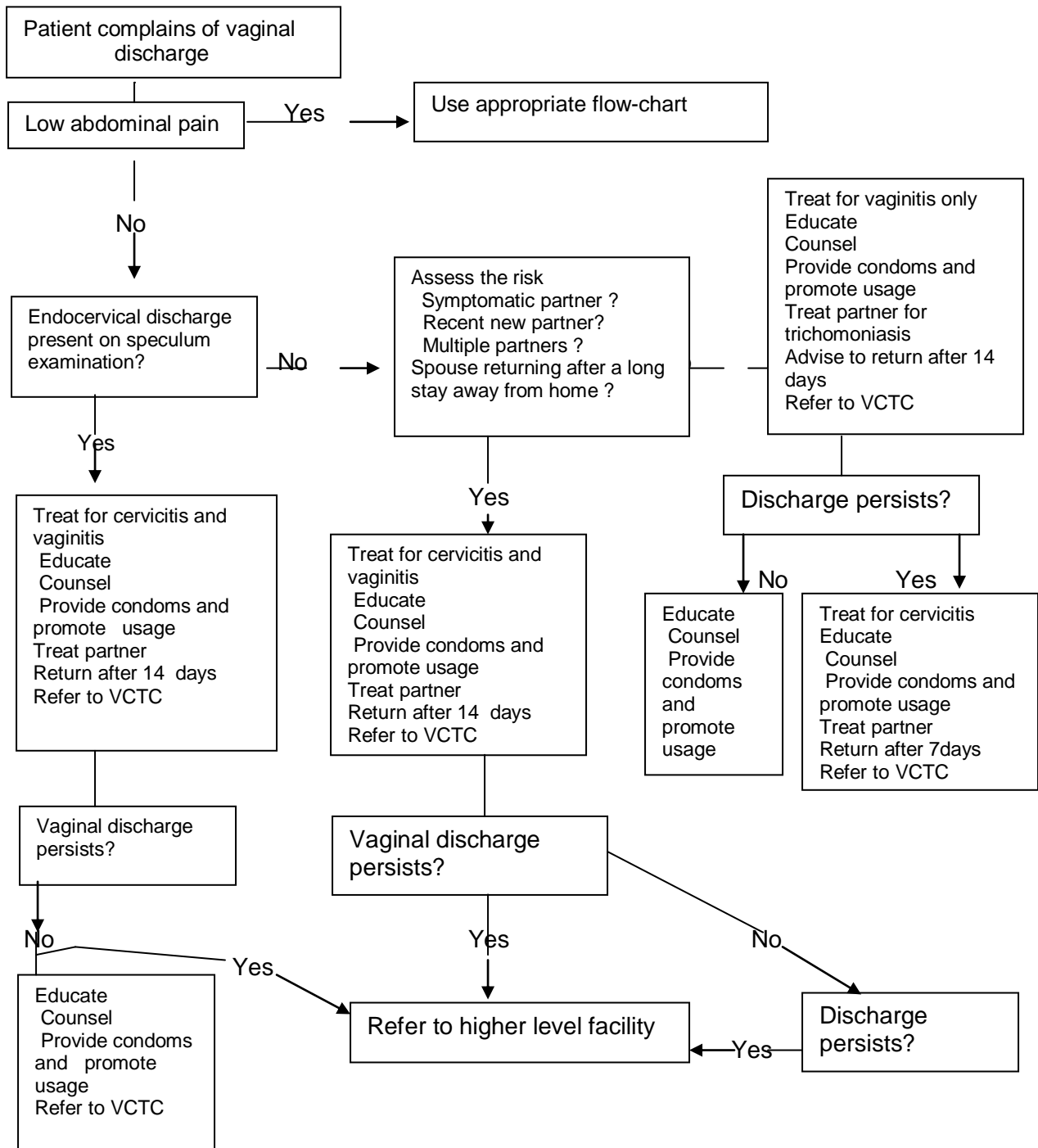
It is the Screening test for Syphilis.²⁰

SYNDROMIC MANAGEMENT OF RTI/STI: 42

**VAGINAL DISCHARGE
(Without Speculum Examination)**



VAGINAL DISCHARGE (With Speculum Examination)



TREATMENT

CERVICITIS :

Recommended regimen: **Azithromycin**, 2 G orally, single dose, under supervision (to treat both gonococcal and chlamydial infections).

Alternate regimen: **Cefixime** 400 mg, orally, single dose, under supervision (to treat gonococcal infection) Plus **Doxycycline*** 100 mg orally, 2 times daily for 7 days (to treat chlamydial infection).

Or Inj. Ceftriaxone 250 mg I.M, single dose (to treat gonococcal infection) Plus **Doxycycline*** 100 mg orally, 2 times daily for 7 days (to treat chlamydial infection).

VAGINITIS :

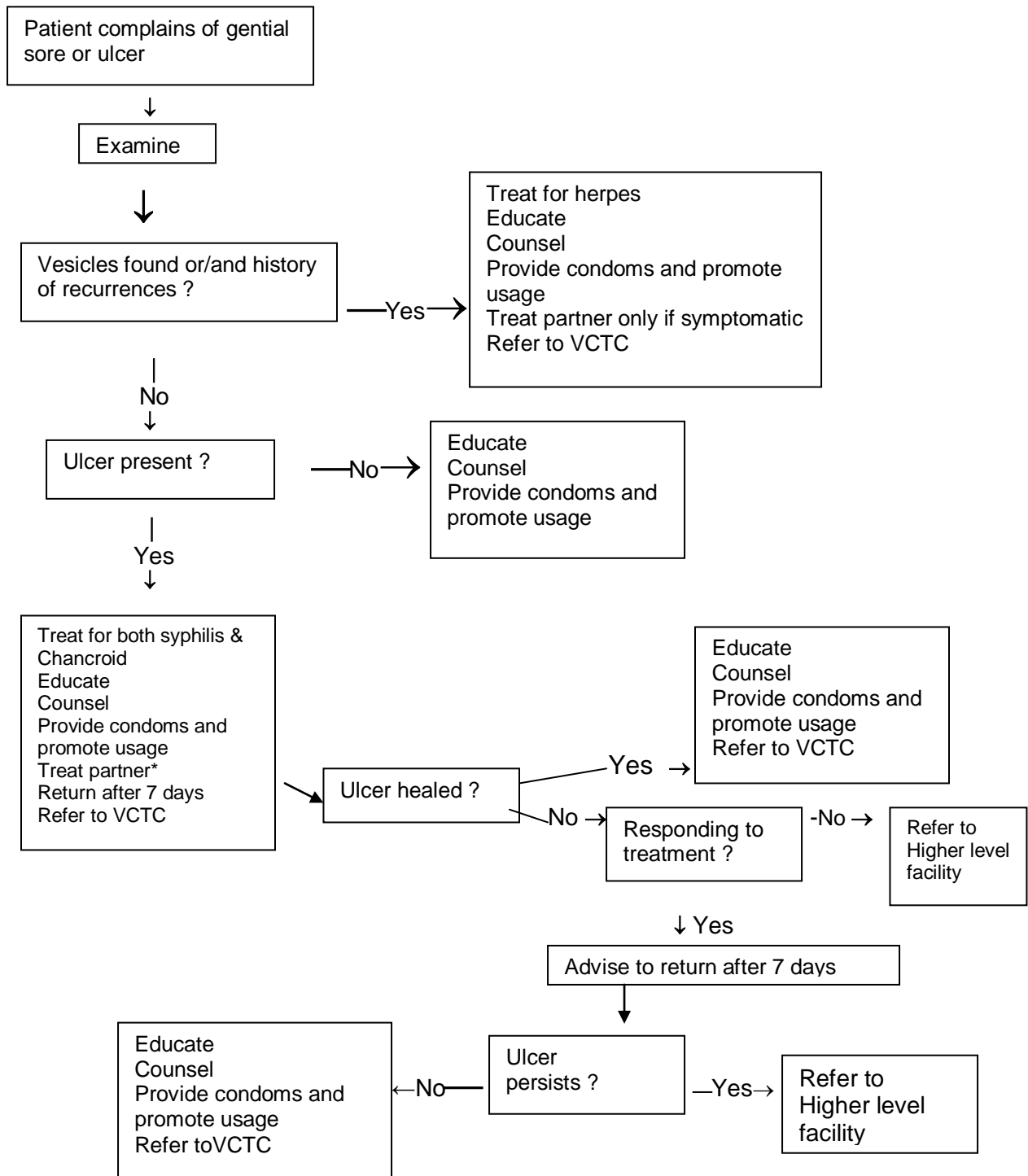
Recommended regimen: **Metronidazole**** 2G orally, single dose, under supervision (to treat trichomoniasis and bacterial vaginosis) Plus **Fluconazole** 150 mg orally, single dose (to treat candidiasis)

Alternate regimen: **Metronidazole**** 400mg orally 2 times a day, for 7 days. (to treat trichomoniasis and bacterial vaginosis Plus **Clotrimazole** 500 mg vaginal pessary once only (to treat candidiasis).

*In individuals allergic /intolerant to doxycycline and in all pregnant woman give erythromycin base/stearate, 500 mg orally, 4 times daily, for 7 days instead of doxycycline.

**Do not give Metronidazole during the first trimester of pregnancy.

GENITAL ULCER



*Treat for syphilis, chancroid and counsel on herpes genitalis.

TREATMENT:

Ask all patients to wash genital area with soap and water.

IF VESICLES ARE SEEN OR/AND HISTORY OF RECURRENCES GIVEN

First episode: Acyclovir 200 mg orally 5 times daily for 7 days

Recurrent episodes: Acyclovir ,400 mg orally, 3 times daily for 5 days

Note: There is no known cure of herpes but the course of the symptoms can be modified by acyclovir.

IF VESICLES ARE NOT SEEN AND NO HISTORY OF RECURRENCES GIVEN

Treat for both syphilis and chancroid.

Recommended regimen: **Inj. benzathine penicillin,*** 2.4 million units I.M, in 2 equally divided doses. Give injection in each buttock, after testing for sensitivity for penicillin (to treat syphilis) Plus **Azithromycin** 1 G, single dose, orally under supervision (to treat chancroid)

Alternate regimen: *Option 1:* **Inj. benzathine penicillin,*** 2.4 million units I.M, in 2 equally divided doses; give one injection in each buttock, after testing for sensitivity for penicillin (to treat syphilis) Plus **Inj. ceftriaxone**, 250 mg, single dose I.M (to treat chancroid)

Option 2 . (Do not use in pregnant women): **Inj. benzathine penicillin,*** 2.4 million units, I.M in 2 equally divided doses. Give, one injection in each buttock, after testing for sensitivity for penicillin (to treat syphilis) Plus **Ciprofloxacin** 500mg two times a day orally for 3 days (to treat chancroid).

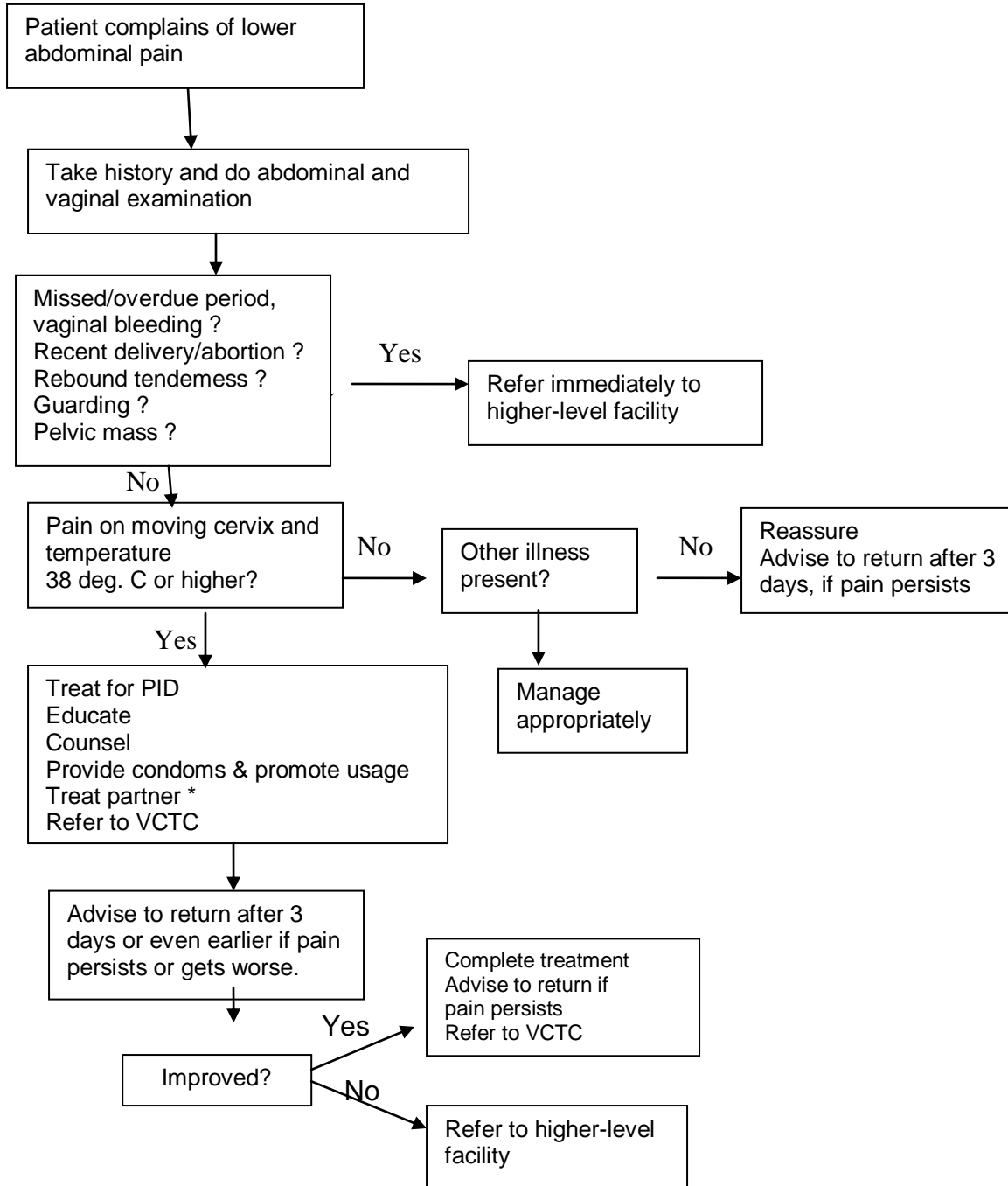
In individuals allergic/intolerant to penicillin

Doxycycline 100 mg, 2 times daily, for 15 days, but *in pregnant women allergic /intolerant to penicillin*

Erythromycin base/ stearate 500 mg, 4 times daily for 15 days.

Ask these women to bring the newborn baby for treatment within 7 days of birth

LOWER ABDOMINAL PAIN



* Treat partner for gonococcal and chlamydial infections.

TREATMENT

Treat patient for gonococcal and chlamydial infection as well as for anaerobic bacteria.

Recommended regimen

Azithromycin 2G orally, single dose under supervision (to treat both gonococcal and chlamydial infections).

Plus Metronidazole** 400 mg orally, 2 times daily, for 14 days (to treat anaerobic bacteria).

Alternate regimen

Option 1

Cefixime 400 mg orally single dose under supervision (to treat gonococcal infection) Plus

Doxycycline* 100 mg orally, 2 times daily, for 14 days (to treat chlamydial infection) Plus

Metronidazole** 400 mg orally, 2 times daily, for 14 days(to treat anaerobic bacteria).

Option 2

Inj. ceftriaxone 250 mg I.M, single dose (to treat gonococcal infection)

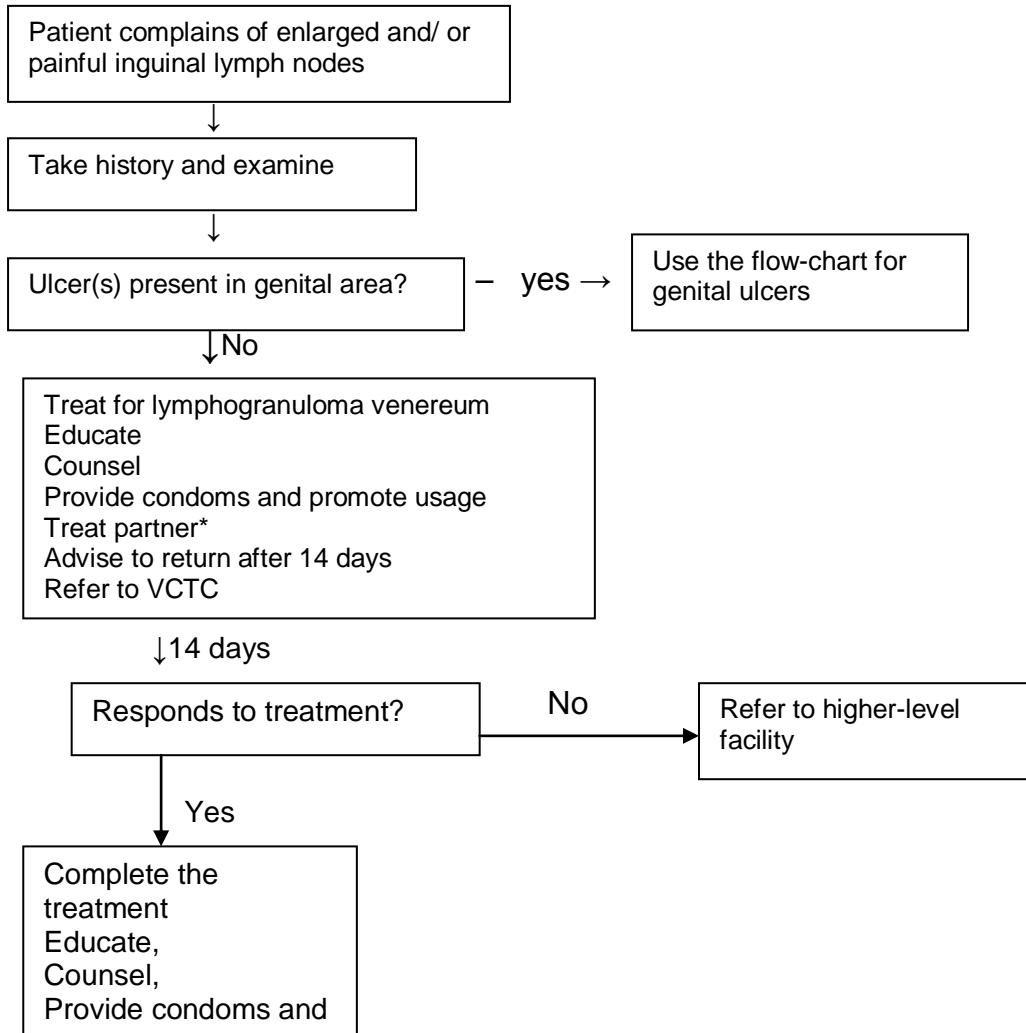
Plus **Doxycycline*** 100 mg orally, 2 times daily, for 14 days (to treat chlamydial infections), Plus

Metronidazole** 400 mg orally, 2 times daily, for 14 days (to treat anaerobic bacteria)

* *In individuals allergic /intolerant to doxycycline and in all pregnant/lactating women use Erythromycin base/stearate, 500 mg orally, 4 times daily, for 14 days instead of doxycycline.*

**Generally, Metronidazole is not recommended during the first trimester of pregnancy. However, it should not be withheld from a highly acute case of PID, which always represents an emergency.

INGUINAL BUBO



* Treat for LGV and counsel for other STIs.

TREATMENT:

Recommended regimen: **Doxycycline** 100mg orally, 2 times a day for 21 days.

Alternative regimen Option 1: **Tetracycline** 500 mg, 4 times a day for 21 days.

Option 2 (for pregnant and lactating women) **Erythromycin base/stearate** 500 mg orally, 4 times a day for 21 days.

If bubo becomes fluctuant, aspirate pus with a wide bore needle and syringe. Make entry into the bubo through adjacent normal healthy skin over a non-dependent area.



MATERIALS AND METHODS

The thesis work entitled “An epidemiological study on RTI/STI among women of reproductive age group in urban slums of Brahmapur city” was carried out in slum areas of Brahmapur city with following objectives.

OBJECTIVES:

- 1) To estimate the problem of RTI/STI among women in reproductive age group by using the syndromic case definition.
- 2) To identify determinants attributed for causation and distribution of RTI/STI in women.
- 3) To assess knowledge, attitude and practices of RTI/STI services among these women.
- 4) To assess the community need for RTI/STI services and to recommend measures for prevention of RTI/STI.

PERIOD OF STUDY:

The present study was carried out over a period of 27 months, from February 2004 to April 2006. The details regarding the period of the study is represented in the Gantt chart.

PLACE OF STUDY:

The study was designed in the Department of Community Medicine, M.K.C.G. Medical College, Brahmapur. It was carried out in the slum areas, covered under the urban I.C.D.S. scheme, Brahmapur City.

Brahmapur is the largest city of southern Orissa with an area of about 79.8 sq. km. It lies at an altitude of 23 m. above the sea level and is about 10 km. away from the Bay of Bengal on its east.

The population of Brahmapur city is 307,792 with 160,354 males and 147,438 females as per 2001 census. In spite of various efforts, the slum population of Brahmapur has reached 97018 and it constitutes about 31.52% of the total population of Brahmapur city. There are 42289 males and 48729 females in slum areas as per 2001 census.⁴³

The population characteristics in urban slum area like socio-cultural variation, floating nature, work culture, away from home, lack of recreation facilities, poor health care utilization and overall compromised living condition make the slum dwellers susceptible for RTI /STI. This calls for special attention to meet people's need in the slum area.

Inhabitants of Brahmapur city are mostly Hindus, constituting 97.07% of population. Muslims and Christians constitute 1.8% & 1.03% of the total population

respectively as per 2001 census. Majority of residents speak Oriya, which is their mother tongue, but a proportion of population also speak Telugu. People in Brahmapur town are influenced by neighboring state of Andhra Pradesh, which is 20 km. from the Brahmapur and there is lot of similarity with the Telugu culture in certain groups of population.

The people of the slum areas of Brahmapur city live in long, narrow, ill ventilated houses. Practice of keeping pets like cow, pig, hen etc. in the same house adds to the adverse living condition. Sanitary conditions in slum areas are very poor and inadequate drainage facilities leads to water logging and pollution. People mainly use pond water for drinking and cooking and they usually go for open field defecation. Utilization of the health services is poor due to lack of health consciousness and poor educational status of the slum dwellers.

Families are patriarchal in nature but women also contribute towards family income by working as daily laborers, maids or petty business. Mixed culture due to difference in caste, language and place of origin of the people is a notable feature in the slums. Early marriages of the girls are a prevailing social practice. Floating nature of population, poor recreational facilities, insecurity and addictions are other predominant features in the slums. Literacy status of slum women is generally low and their access to health care is severely restricted. Irrespective of the contribution towards family income, the social status of girls and women is low.

STUDY TYPE:

Cross – sectional study.

MAP OF BRAHMAPUR MUNICIPALITY



STUDY POPULATION:

The population included in the present study was the women of reproductive age group (15-45 years) residing in slum areas and in slum households of Brahmapur city.

SAMPLING FRAMEWORK:

To overcome the limitations of time, resources and labour the sampling technique was considered in the study design. Due consideration was given on the size of the sample so as to make it a representative one.

Sample size:

In the Annual Report of Government of India (1999-2000) by Ministry of Health & Family Welfare, it was reported that the prevalence of currently married women of age group 15-44 years with symptoms of RTI/STD to be 28.8%.⁴⁴ This observation was taken into consideration to determine the required sample size in the present study. For calculation of the sample size, the formula applied was: $n = 4pq/L^2$ where

n = sample size

p = positive character (in %)

q = not having the positive character (in %) {100 – p}

L = Allowable error

Hence, at 10% allowable error,

$$n = \frac{4 \times 28.8 \times 71.2}{2.88 \times 2.88} = 988.88 \approx 989$$

At 20% allowable error,

$$n = \frac{4 \times 28.8 \times 71.2}{5.76 \times 5.76} = 247$$

Considering the convenience & feasibility of the field study it was decided to study at least 250 women of reproductive age group.

Sampling:

Brahmapur city is covered under urban ICDS scheme and there are 100 anganwadi centres (AWC) functioning at present. In consultation with the CDPO, the anganwadi centres mostly serving the slum areas were identified. For the study purpose 10 (10%) anganwadis were selected purposively at and near Ankoli as it is the field practice area of Department of Community Medicine.

These selected anganwadis are noted below and represented in the map.

Radhakrushna Matha sahi	Lanjipalli Bauri sahi
Lanjipalli Harijan sahi	Panda colony
Ankoli Bauri sahi -I	Ankoli Bauri sahi – II
Pankellapalli	Mainroad Bauri sahi
Jaleswarkhandi	Khadasingh Bauri sahi

Since no definite intervention related to RTI/STI was taken up in the urban area of Brahmapur city, the selection of these anganwadi areas will be representative of the total

slum population. The study subjects were selected from these 10 anganwadi centres areas. Hence, 25 women were selected from each anganwadi centre area.

Total number of slum households in 100 anganwadi centre areas is 22191 as per ICDS record. On an average, there are 221 households in each anganwadi centre area. 25 women were selected from 221 households with the sampling interval $221/25 = 8.84 \approx 9$. Starting from one household at random, every 9th household was chosen for the study.

Proportion of women in different age groups such as 15-19, 20-24, 25-29, 30-34, 35-39 and 40-45 years was calculated after verifying the master register of one anganwadi centre selected at random to satisfy population proportionate sampling for selection of study subjects. Based on the proportion 20%, 18%, 21.6%, 14%, 13.6%, 12.8% in the age groups 15-19, 20-24, 25-29, 30-34, 35-39 and 40-45 years respectively, it is calculated to include 5, 5, 5, 4, 3, 3 women from 25 in one anganwadi area. One woman was selected in each household to cover the younger to elder age group.

Pre-Testing:

For the recording of data a schedule was prepared. At the beginning of the study, this instrument was pre-tested on ten subjects to test the feasibility, reliability & validity of the questions and to make sure that the questions don't hurt the sentiments of the subjects while eliciting the required information. Keeping these in mind, the questionnaire/ schedule was modified, corrected & finalized for data collection.

Data collection:

The study was taken up with the help of the female social worker of the urban health centre who accompanied the investigator during her scheduled bi-weekly visit to

the households. The households not satisfying the criteria of a slum household were excluded from the study. The head of the households and the women of reproductive age group selected for study were explained regarding the nature and purpose of the study prior to the examination and data collection. If the women in the reproductive age group were absent during first visit, the next household close to the doorstep was assessed. If two or more women present in the same age group in one household, then the woman of the higher age was included in the study.

Collection of data was done in a friendly atmosphere after obtaining their verbal consent. Some time was spent, at the beginning, on informal discussions with the purpose of gaining the confidence of the subjects and their family members. Care was taken to make the subjects aware regarding the purpose of the study and to impress upon them that the information revealed by them in the process would be kept strictly confidential.

General & specific information were collected at their house. They were motivated to come to the urban health centre for further examination and investigations. Those women who were reluctant and refused were excluded from the study.

Clinical examinations of women who came to UHC were conducted by investigator herself that include per abdominal/ per vaginal/ per speculum examination. After required laboratory investigations i.e. Whiff test, wet mount, Gram's stain, VDRL test, the findings were recorded in the schedule. Specific examinations and investigations of the vaginal discharge were not conducted in unmarried women.

Those women who were diagnosed to be suffering from RTI/STI were treated in the urban health centre for their benefit & co-operation from others.

Data processing and analysis:

The information thus collected was processed and analyzed with the help of SPSS package and wherever necessary through manual calculation.

Limitations of the study:

- In the present study, sample size was decided considering the convenience and feasibility of field study.
- Per vaginal and per speculum examination could not be done in unmarried women due to social causes.
- Laboratory facility was limited for causal diagnosis of RTI/STI.

EXPLANATORY NOTE:

Slum:

A slum was defined as an area unit having five or more kutcha structures mostly of temporary nature, or fifty or more households residing mostly in kutcha structures, huddled together, or inhabited persons with practically no private latrine and inadequate public latrine and water facilities.⁴⁵

If there are more than 20 families residing in an area of 700 sq. met. i.e. 35 met. x 20 met. with or without ownership and minimal urban facilities like road communication, electricity and drinking water supply, then it is called a slum.⁴⁶

Slum household:

A house was considered as a slum household, if it was made up of kutcha or Kutcha-pucca structure with no private tap or private service latrine.⁴⁵

General information, in the schedule (Annexure), include name, age, religion, caste, education, marital status, total number of family members, occupation, per capita monthly income etc.

Educational status:

Categorization of the educational status was done according to the following criteria.

Illiterate: Illiterate person was considered to be one who couldn't read & write or a person who could merely read but couldn't write.

Literate: A person was considered literate if he / she could read & write with understanding in any language.⁴³

Just literate: A person who can read and write but has not gone to school.

Primary: A person who had read up to class-V was categorized as primary.

Secondary: A person who had continued schooling up to the classes anywhere between class-VI & X.

Above secondary: A person who had read beyond class-X.

Social Class:

For the assessment of social class, Prasad's classification was used taking into consideration the per capita family income.⁴⁷ In order to update this classification the All India Consumer Price Index Number for the month of December 2003 was considered, when the value was fixed at 502.⁴⁸ The conversion factor from the new to old series is 4.93 in regard to the general index.

The correction factor = [The value of All India Consumer Price Index Number × 4.93] /100.

Thus the correction factor for December 2003 is $502 \times 4.93 / 100 = 2474.86/100 = 247486 \approx 24.75$. Hence Rs 100/- in 1961 is equivalent to Rs 2475 in Dec. 2003.

Social Class	Per-capita family income, 1961	Per-capita family income, 2003	Per-capita family income, Modified, 2003	Social class
I	100 & above	≥ 2474.86	≥ 2475	Upper
II	50-99	1237.5-2450.25	743-2474	Middle
III	30-49	742.5-1212.75		
IV	15-29	371.25-717.75	Up to 742	Low
V	Below 15	< 371.25		

Syndromic approach:

WHO has identified syndromic approach for identifying and managing cases with RTIs/STIs which provide health workers with a tool to improve the diagnostic process. Syndromic management identifies consistent group of symptoms and easily recognized signs and provide guidelines for treatment that deals with majority of organisms responsible for producing each syndrome such as vaginal discharge, genital ulcer, and pain in lower abdomen including pelvic inflammatory disease and inguinal bubo.²²

Pelvic inflammatory disease:

Pelvic inflammatory disease was labeled when there was history of lower abdominal pain or lower backache or pain on moving cervix, with or without cervicitis or vaginitis.³⁵

Hygienic practice by women:

Practice of hygiene by the women plays an important role in transmission of RTI/STI. For assessment of hygiene, three criteria were taken into consideration i.e. menstrual hygiene, sexual hygiene and genital hygiene.

Menstrual hygiene – was assessed by asking regarding use of sanitary napkins during menstrual cycle.

Sexual hygiene - was assessed by asking regarding practice of cleanliness of private parts following sexual intercourse.

Genital hygiene - was assessed by asking about cleaning genital organs after urination.

The overall hygienic status categorized as good, average or poor basing on the criteria as follows.

Good - Using sanitary napkins during menstruation and cleaning private parts after sexual intercourse & urination.

Poor – Using ill maintained pads, clothes and not cleaning private parts following sexual intercourse & urination.

Average – Mixed responses.

Swab collection and processing:

Two vaginal swabs were collected from each of the above groups of patients by sterile cotton tipped swabs from posterior vaginal fornix using aseptic precautions. One of the swabs was put in 0.5 ml. of sterile physiological saline. The other swab was smeared over a clean, dry microscopic slide and was stained by Gram's staining technique.

Whiff test (Amine test):

The amine test was performed by adding few drops of 10% KOH (potassium hydroxide) solution directly over the soaked swab to find out if there was emission of amine like odour.⁵

Direct microscopic examination of a Wet mount:

A drop from the saline containing swab tube was taken over a clean, dry glass slide, mounted with a coverslip and was examined under the high power objective. The wet preparation was assessed for the presence of motile trophozoites of trichomonas, budding yeast cells and clue cells.⁴⁹

Trichomoniasis: Typical jerky motility. These are clear, pear shaped organisms about the size of a pus cell with four anterior flagellae. These organisms soon loose their jerky movement.

Bacterial vaginosis: Clumps of epithelial cells may be present. Cell outline is indistinct and resulting into a distinct granular appearance.

Candidiasis: Yeast cells may be seen as double walled retractile bodies with a size more than 10 microns. Oval shaped. Some cells show budding halos.

Direct microscopy with Gram's staining:

The smear was made on the center of a clean glass slide and then air dried and heat fixed. The smear was then flooded with methyl violet and kept for 30 seconds. The slide was rinsed with tap water and Gram's iodine was added and allowed to remain for one minute. The slide was again rinsed with tap water and decoloriser (acetone alcohol) was applied for 10 seconds and rinsed off immediately. Then safranin (counter stain) was added. The slide was then kept for 30 seconds, rinsed in tap water and air dried. Finally the smear was observed under oil immersion lens.⁵⁰

Gonorrhoea: Presence of diplococci with polymorphonuclear leukocytes.

Candidiasis: Presence of budding yeast cells.

Clue cells: Squamous epithelial cells covered with bacilli

VDRL test:

It is the Screening test for Syphilis. It was carried out with the help of VDRL kit containing concave glass slides, pipettes and disposable plastic tips. 60 micro lit. of serum was put in a clean glass slide and 20 micro lit. of antigen was added to the serum. Then it is mixed with a wooden stick and the slide is rotated for 4 min. with mechanical rotator (180 rpm). Then the test was read microscopically.⁵¹

Negative: smooth homogenous particles of antigen.

Positive: Large clumps of antigen with marked background clearing.



RESULTS

The present study entitled, “An epidemiological study on RTI/STI among women of reproductive age group in urban slums of Brahmapur city” was carried out in slum areas of Brahmapur city from February 2004 to April 2006. A sample of 250 women of reproductive age group was selected from ten Anganwadi areas at and near Ankoli, 25 from each area.

TABLE: I

AGE DISTRIBUTION OF THE STUDY POPULATION

Age Group in Years	Number (Percentage)
15-19	50 (20)
20-24	50 (20)
25-29	50(20)
30-34	40(16)
35-39	30(12)
40-45	30(12)
Total	250(100)

Out of 250 study subjects selected for the study, the women included in the age groups 15-19, 20-24, 25-29, 30-34, 35-39 and 40-45 years were 20%, 20%, 20%, 16%, 12% and 12% respectively. This age distribution reflects the age composition of 15-45 year women in the urban slums of Brahmapur city.

TABLE: II
CASTE DISTRIBUTION

Caste	Number (Percentage)
S.T.	7 (2.8)
S.C.	82 (32.8)
S.E.B.C.	117 (46.8)
General	44 (17.6)
Total	250 (100)

Out of 250 women of reproductive age group, 46.8% were socially and economically backward class (SEBC), 32.8% were scheduled caste and 2.8% were scheduled tribe. Only 17.6% of study group were belonging to general category. All of them were Hindus by religion.

TABLE: III
EDUCATION OF WOMEN

Education		Number (Percentage)
Illiterate		107 (42.8)
Literate	Primary	69 (27.6)
	Secondary	53 (21.2)
	Above secondary	21 (8.4)
	Subtotal	143 (57.2)
Total		250 (100)

Education is one of the important characteristics for improvement of health. In the present study, 57.2% women were literate and 42.8% were illiterate. 27.6% of the study subjects were educated up to primary level, 21.2% up to secondary level and 8.4% had above secondary education.

TABLE: IV
DISTRIBUTION BY OCCUPATION

Occupation	Number (Percentage)
Housewife	151 (60.4)
Unmarried Engaged in household work	31 (12.4)
Labourer	35 (14)
Housemaid	4 (1.6)
Semiskilled worker	4 (1.6)
Service	4 (1.6)
Small scale business	1 (0.4)
Student	20 (8)
Total	250 (100)

Majority (60.4%) of women were house wives, 12.4% engaged in household work (unmarried), 14% were labourers or unskilled workers, 1.6% were house maids, 1.6% were semiskilled workers (tailoring), 1.6% doing service, 0.4% doing small scale business, and 8% were students.

TABLE: V
ECONOMIC STATUS

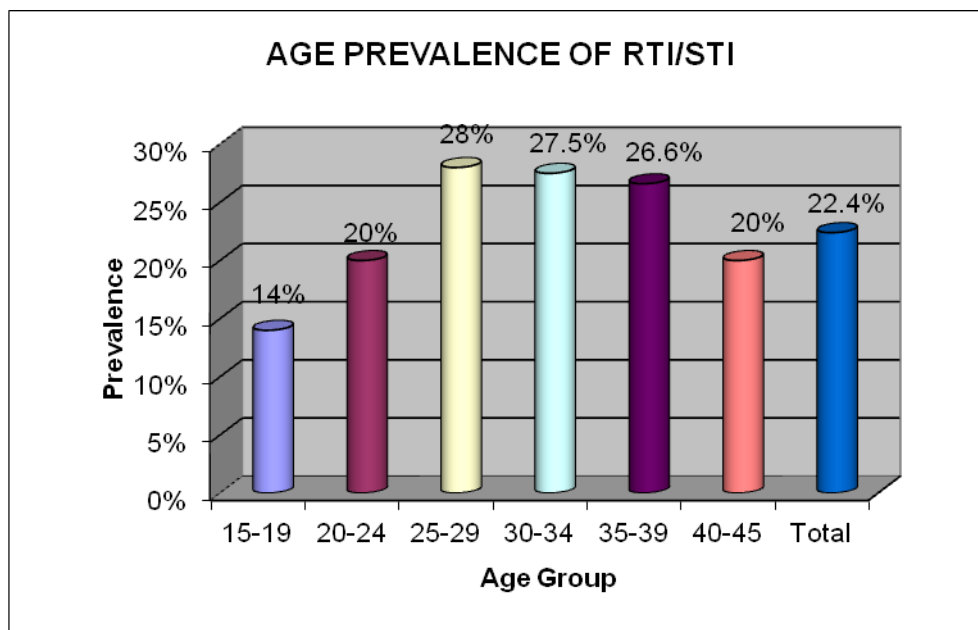
Social Class	Per capita family income	Number (Percentage)
Low	Up to 742	173 (69.2)
Middle	743-2474	77 (30.8)
Upper	≥ 2475	Nil
Total		250 (100)

Monthly per capita family income was taken into consideration to assess the economic status of the women and was classified as low, middle & upper social class according to Prasad's classification. Accordingly it was low for 69.2% women and middle for 30.8% of them. None of the subjects belonged to the upper social class.

TABLE: VI

AGE DISTRIBUTION OF RTI/STI CASES

Age Group	No. of women examined (n)	No. of RTI/STI cases	Age prevalence (%)	Proportional case rate (%)
15-19	50	7	14	12.5
20-24	50	10	20	17.9
25-29	50	14	28	25
30-34	40	11	27.5	19.6
35-39	30	8	26.6	14.3
40-45	30	6	20	10.7
Total	250	56	22.4	100

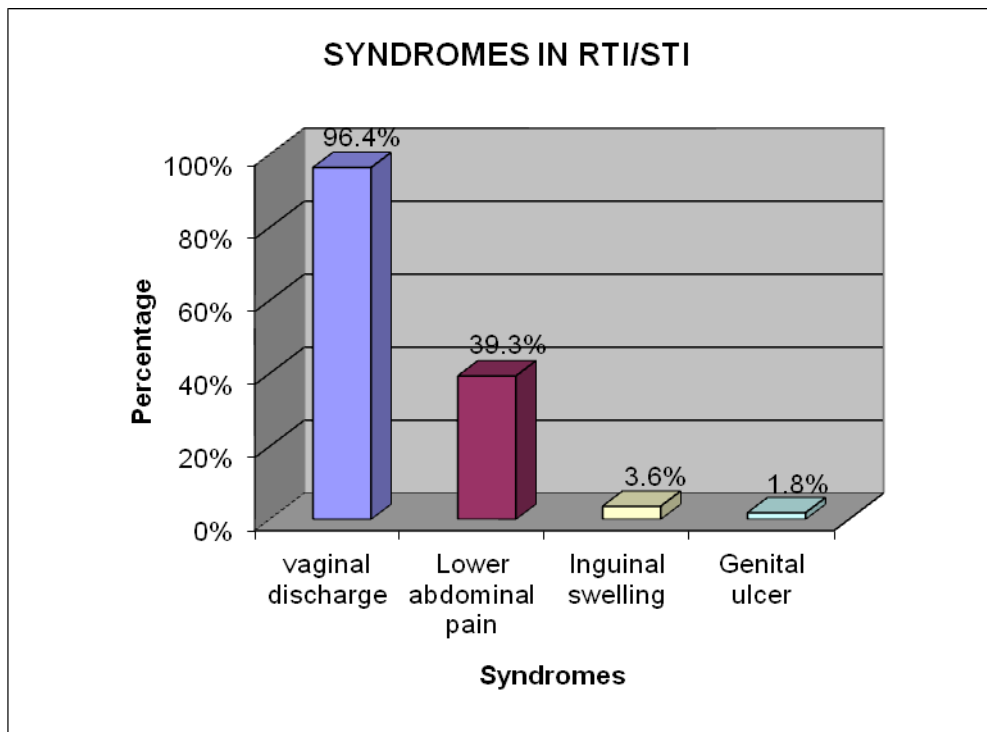


Out of 250 study women in the age group of 15-45 years assessed for RTI/STI, 56 were having syndromes giving rise to a prevalence of 22.4%. Maximum i.e. 28% of RTI/STI cases found in the age group of 25-29 years followed by 27.5% and 26.6% in the age group 30-34 and 35-39 respectively. It is less prevalent i.e. 14% in the age group 15-19 years and 20% in both in the age groups of 20-24 and 40-45 years. Proportional case rate is more i.e. 25% in the age group of 25-29 years and 19.64% in 30-34 years.

TABLE: VII

DISTRIBUTION OF WOMEN AS PER SYNDROMIC DEFINITION

Symptoms	Number (Percentage)
Vaginal discharge	33 (58.9)
Lower abdominal pain	2 (3.6)
Vaginal discharge + Lower abdominal pain	19 (33.9)
Vaginal discharge + Lower abdominal pain + Inguinal swelling	1 (1.8)
Vaginal discharge + Inguinal swelling + Genital ulcer	1 (1.8)
Total	56 (100)

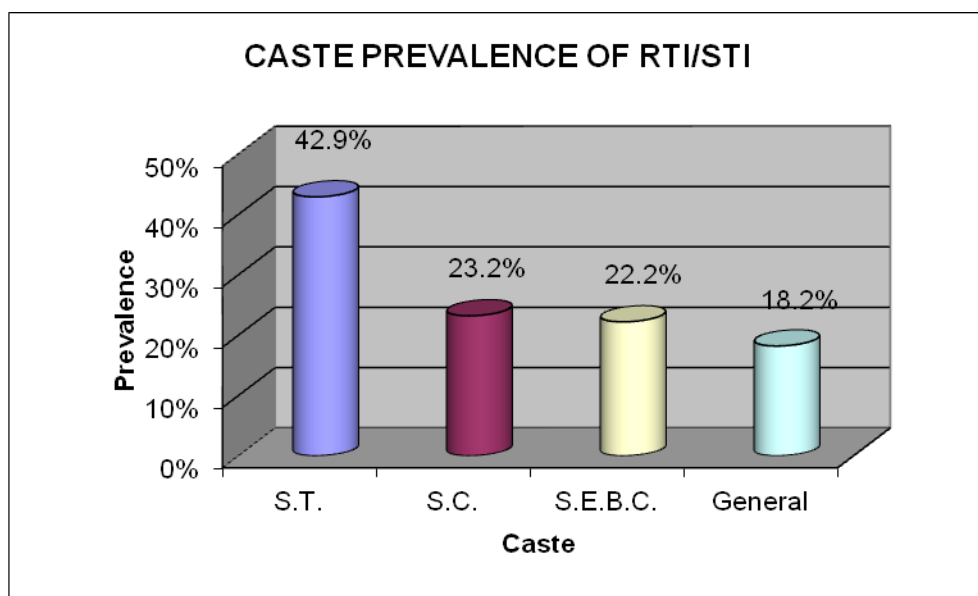


Out of 56 cases diagnosed as RTI/STI syndromes, most common syndrome found in women was vaginal discharge in 54 (96.4%) followed by lower abdominal pain 22 (39.3%), inguinal swelling 2 (3.6%) and genital ulcer 1 (1.8%). Only vaginal discharge was found in 58.9% cases and lower abdominal pain in 3.6% cases. The combination of vaginal discharge & lower abdominal pain was observed in 33.9%, vaginal discharge, lower abdominal pain & inguinal swelling in 1.8% and vaginal discharge, inguinal swelling & genital ulcer in 1.8% of RTI/STI cases.

TABLE: VIII

CASTE DISTRIBUTION OF RTI/STI CASES

Caste	No. of women examined (n)	No. of RTI/STI cases	Caste prevalence of RTI/STI (%)
S.T.	7	3	42.9
S.C.	82	19	23.2
S.E.B.C.	117	26	22.2
General	44	8	18.2
Total	250	56	22.4

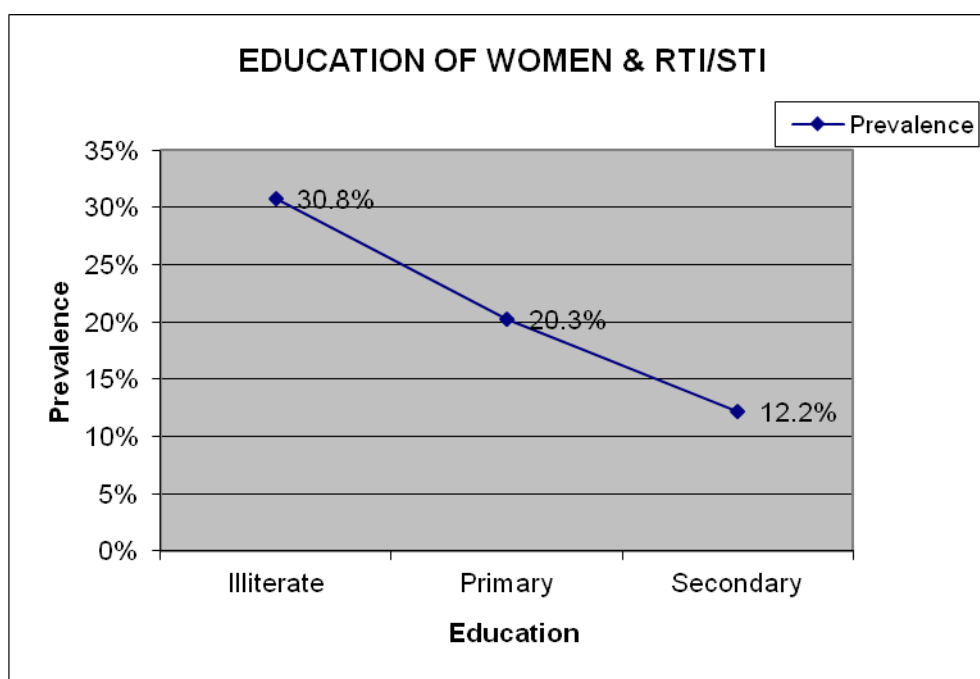


RTI/STI was found to be more 42.9% and 23.2% in ST and SC group of women respectively than SEBC (22.2%) and general caste (18.2%), There is no significant difference between General caste and backward castes ($\chi^2 = 0.547$, $p > 0.05$).

TABLE: IX

RTI/STI AND EDUCATION OF WOMEN

Education	No. of women examined (n)	No. of RTI/STI cases	Prevalence in different educational classes (%)
Illiterate	107	33	30.8
Primary	69	14	20.3
Secondary	53	6	12.2
Above secondary	21	3	
Total	250	56	22.4



The prevalence of RTI/STI cases observed to be higher in illiterate women (30.8%) followed by women having primary education (20.3%). It was 11.3% and 14.3% in women having secondary and above secondary education respectively. RTI/STI was significantly higher in illiterate women in comparison to women with different educational level ($\chi^2 = 9.0186$, d.f. = 2, $p < 0.02$).

TABLE: X**RTI/STI AND OCCUPATION OF WOMEN**

Occupation	Women examined No. (%ge)	No. of RTI/STI cases (Prevalence)
Housewife	151 (60.4)	38 (25.16%)
Engaged in household work (unmarried)	31 (12.4)	6 (19.35%)
Labourer	35 (14)	10 (28.57%)
Housemaid	4 (1.6)	1 (25%)
Semiskilled worker / Service/ Small scale business	9 (3.6)	0 (0%)
Student	20 (8)	1 (5%)
Total	250 (100)	56 (22.4%)

It was observed that 28.57% of unskilled laborers and 25% of housemaids were having RTI/STI. 25.16% of housewives and 19.35% of women who engaged in household work (unmarried) were having RTI/STI. 5% of the students were diagnosed of having syndromes. No case found in women doing small-scale business, semiskilled worker and others.

TABLE: XI**RTI/STI AND EDUCATION OF HUSBAND**

Education of Husband	No. of persons	No. of RTI/STI cases	Prevalence in different educational classes (%)
Illiterate	24	6	25
Primary	31	7	22.6
Secondary	82	25	27.5
Above secondary	38	8	
Total	175	46	26.3

About 27.5% of women whose husbands were educated up to secondary or above secondary level were found to be suffering from RTI/STI and 25% of women whose husbands were illiterate and 22.6% women whose husbands had primary education. The difference was not significant between these groups ($\chi^2 = 0.307$, $p > 0.05$).

TABLE: XII**RTI/STI AND OCCUPATION OF HUSBAND**

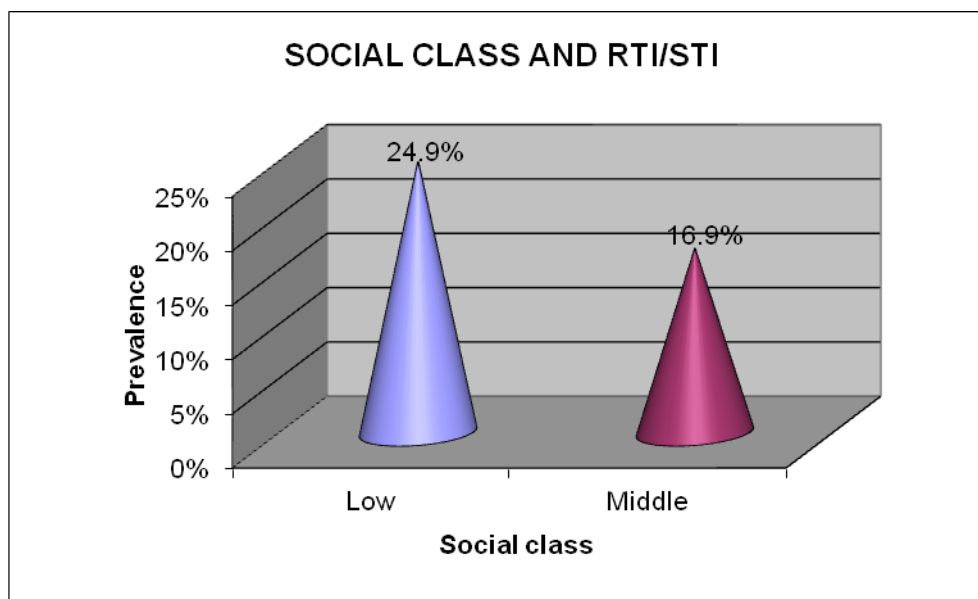
Occupation of Husband	No. of persons	RTI/STI cases (Prevalence)
Unskilled worker	71	20 (28.2%)
Semiskilled worker	26	7 (26.9%)
Skilled worker	41	10 (24.4%)
Small scale business	36	9 (25%)
Unemployed (Blind)	1	0 (0%)
Total	175	46 (26.3%)

It was observed that RTI/STI cases 28.2%, 26.9%, 24.4% in wives of unskilled, semiskilled, skilled workers respectively. It was 25% in women whose husbands were doing small-scale business.

TABLE: XIII

RTI/STI AND SOCIAL CLASS

Social Class	No. of women examined	No. of RTI/STI cases	Prevalence in diff. social class
Low	173	43	24.9%
Middle	77	13	16.9%
Total	250	56	22.4%



RTI/STI syndromes found to be more in women of low social class (24.9%) than middle social class (16.9%), but the difference was not significant ($\chi^2 = 1.948$, $p > 0.05$). However in the present study, no women were present in upper social class.

TABLE: XIV

RTI/STI AND TYPE OF FAMILY

Type of family	Women examined No. (%ge)	RTI/STI cases No. (%ge)	Prevalence rate
Nuclear	186 (74.4)	44 (78.6)	23.7%
Joint	48 (19.2)	8 (14.3)	16.6%
Extended	16 (6.4)	4 (7.1)	25%
Total	250 (100)	56 (100)	22.4%

It was observed that 78.6% of the RTI/STI cases were present in women of nuclear family, 14.3% in the joint family and 7.1% in the extended family. Prevalence of RTI/STI was maximum in women of nuclear family (23.7%) and it was 16.6% in joint and 25% in extended family.

TABLE: XV**RTI/STI WITH PAST HISTORY OF SUCH INFECTION**

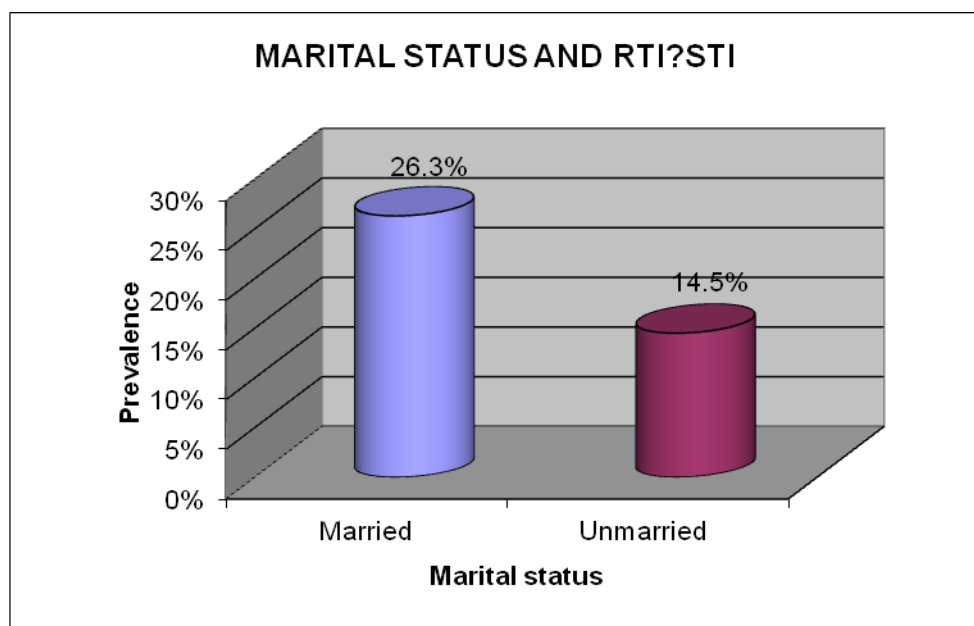
Status of RTI/STI	Past H/O RTI/STI		
	Yes (%)	No (%)	Total (%)
No RTI/STI	27 (62.8)	167 (80.7)	194 (77.6)
RTI/STI present	16 (37.2)	40 (19.3)	56 (22.4)
Total	43 (17.2)	207 (82.8)	250 (100%)

Out of 250 study subjects, past history of RTI/STI was elicited in 43 (17.2%) women; 37.2% of them were diagnosed having RTI/STI and 19.3% of women without such history were having RTI/STI during assessment. There is significant association between RTI/STI and past history of such infection ($\chi^2 = 6.557, p < 0.02$).

TABLE: XVI

RTI/STI AND MARITAL STATUS

Marital status	No. of women examined (n)	No. of RTI/STI cases	Prevalence rate (%)
Married	175	46	26.3
Unmarried	69	10	14.5
Widow/divorcee	6	0	0
Total	250	56	22.4



It was observed that 26.3% of married women and 14.5% of unmarried women had RTI/STI syndromes. Marital status is significantly associated with RTI/STI ($\chi^2 = 3.887, p < 0.05$). RTI/STI was not found in widows/divorcee in this study.

TABLE: XVII

RTI/STI AND AGE AT MARRIAGE

Age at marriage (years)	No. of women examined (n)	No. of RTI/STI cases	Prevalence rate (%)
< 15	22	9	40.9
15-20	113	25	22.1
20-25	40	9	22.5
> 25	6	3	50
Total	181	46	25.4

RTI/STI cases observed to be higher when the age at marriage is less than 15 years or more than 25 years of age i.e. 40.9% and 50% respectively. It is found to be 22.1% and 22.5% when the age at marriage was 15-20 and 20-25 years.

TABLE: XVIII**RTI/STI AND DURATION OF MARRIED LIFE**

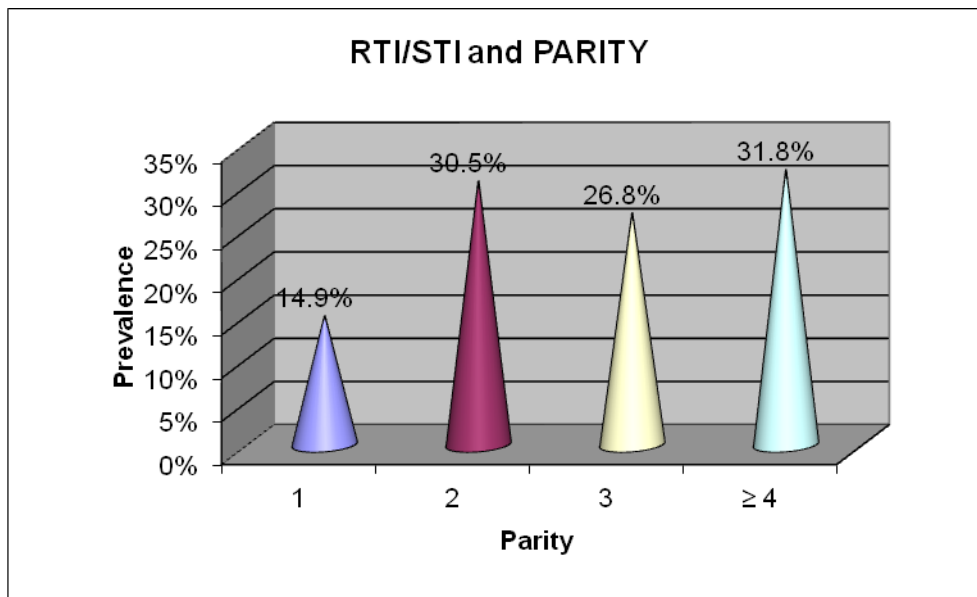
Duration of married life (years)	No. of women examined (n)	No. of RTI/STI cases	Prevalence rate
< 5	41	8	19.5
5-10	39	10	25.6
10-15	28	9	32.1
> 15	67	19	28.4
Total	175	46	26.3

The above table shows that RTI/STI syndromes more when the duration of married life was 10 to 15 years (32.1%) and 28.4% in more than 15 years. It came out to be 25.6% when the duration was 5-10 years and 19.5% in less than 5 years duration.

TABLE: XIX

RTI/STI AND PARITY

Parity	No. of women examined	No. of RTI/STI cases	Prevalence (%)
1	47	7	14.9
2	59	18	30.5
3	41	11	26.8
≥ 4	22	7	31.8
Total	169	43	25.4



Considering the parity wise distribution of cases, it was seen that maximum i.e. 31.8% of study subjects were having ≥ 4 children. It was 24.5% in women with less than 4 children, but the difference was not significant ($\chi^2 = 0.54$, d.f. = 1, $p > 0.05$). It was least i.e. 14.9% in women with one child.

TABLE: XX

RTI/STI AND HISTORY OF ABORTION

H/O abortion	No. of women examined	RTI/STI cases (%ge)
Present	28	14 (50%)
Absent	153	32 (20.9%)
Total	181	46 (25.4%)

History of abortion during last one year was assessed in women with RTI/STI syndromes. It was revealed that with presence of abortion history, the RTI/STI syndromes found in 50% women and 20.91% of women without abortion history. The association between H/O abortion and RTI/STI was highly significant ($\chi^2 = 10.556$, $p < 0.001$).

TABLE: XXI**RTI/STI AND USE OF CONTRACEPTIVES**

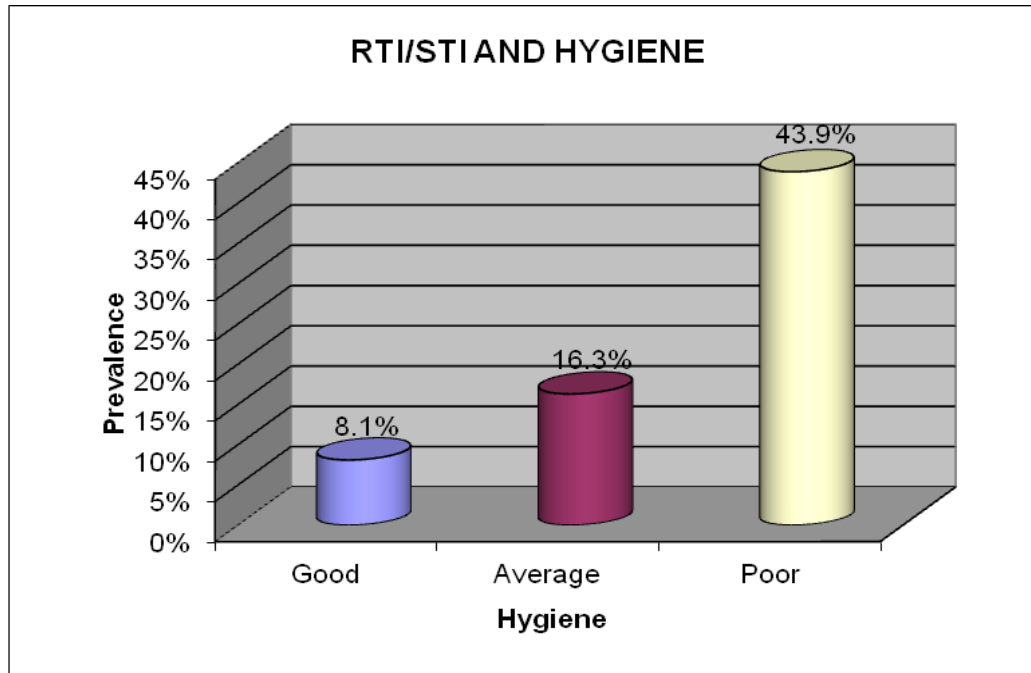
Contraceptives	No. of women examined	No. of RTI/STI cases	Prevalence rate
IUCD	5	2	40%
OCP	32	6	18.8%
Barrier method	2	0	0%
Permanent method	99	29	29.3%
No methods	112	19	16.9%

RTI/STI found in 40% of women using IUCD, 18.8% of women taking OC pills and 29.3% of women using who had undergone permanent sterilization or not using any contraceptives. No case of RTI/STI was found in women using barrier contraceptives. RTI/STI prevalence was 16.9% in women not using any methods.

TABLE: XXII

RTI/STI AND MAINTENANCE OF HYGIENE

Maintenance of hygiene	No. of women examined	No. of RTI/STI cases	Prevalence rate
Good	37	3	8.1%
Average	147	24	16.3%
Poor	66	29	43.9%
Total	250	56	22.4



Maintenance of hygiene was taken into consideration by assessing hygiene after intercourse, after urination and during menstrual cycle. It was graded into good, average and poor. In women with poor maintenance of hygiene, prevalence of RTI/STI was maximum i.e. 43.9%. Prevalence was 16.3% and 8.1% in women maintaining average and good hygiene respectively. The difference between these groups was highly significant ($\chi^2 = 25.088$, d.f. = 2, $p < 0.001$).

TABLE: XXIII

RTI/ STI AND HUSBAND WITH H/O STD

Husband with H/O STD	No. of women examined	No. of RTI/STI cases	Prevalence rate
Positive	2	2	100%
Negative	173	44	25.4
Total	175	46	25.4

In 2 cases giving positive history of STD in husband found to be having RTI/STI and it was 25.4% in women not giving positive history.

TABLE: XXIV

OTHER ASSOCIATED SYMPTOMS WITH RTI/STI

(n = 56)

Other Symptoms	Number (Percentage)
Itching of vulva	24 (42.9)
Backache	16 (28.6)
Burning micturation	2 (3.6)
Pain during micturation	1 (1.8)
Pain during intercourse	1 (1.8)
Multiple symptoms	8 (14.3)

The most common associated symptom was itching of vulva (42.9%) followed by backache (28.6%). Burning micturation found in 3.6% RTI/STI cases. In same proportion of cases (1.8%), the other associated symptom was Pain during micturation and Pain during intercourse. Multiple symptoms observed in 14.3% of cases.

TABLE: XXV

TYPE OF DISCHARGE IN RTI/STI CASES

(n = 54)

Type of discharge	Number (Percentage)
Watery	29 (53.7)
Curd like	13 (24.1)
Purulent	7 (12.9)
Mixed	5 (9.3)

In maximum (53.7%) cases, the discharge was watery followed by curdy discharge (24.1%). In 12.9% cases, the discharge was Purulent. Mixed discharge found in 9.3% cases.

TABLE: XXVI**FINDINGS IN PER SPECULUM EXAMINATION**

Findings in per speculum examination (n = 181)	Asymptomatic women (n =135) No. (%)	Symptomatic cases (n =46) No. (%)
Cervical discharge	5 (3.7)	20 (43.5)
Cervical erosion	3 (2.2)	9 (19.6)
Congestion of cervix	2 (1.5)	7 (15.2)
Hypertrophy of cervix	0 (0)	3 (6.5)
Nabothian follicles	1 (0.7)	1 (2.2)
Cervical discharge + Cervical erosion	0 (0)	4 (8.7)
Cervical discharge + Congestion	0 (0)	2 (4.3)

In per speculum examination, cervical discharge was found in 56.5% of RTI/STI cases followed by cervical erosion (28.3%) and congestion of cervix (19.6%). Cervical hypertrophy was found in 6.5% and nabothian follicles in 2.2% of married women with RTI/STI. Speculum examination could not be conducted in unmarried women. It was observed that cervical discharge was found in 3.7%, cervical erosion in 2.2%, congestion of cervix in 1.5%, nabothian follicles 0.7% of asymptomatic women.

TABLE: XXVII**CLINICAL DIAGNOSIS**

Clinical Diagnosis	Number (%ge)
Symptomatic cases (n = 46)	
Vaginitis	5 (10.9)
PID	2 (4.3)
Vaginitis + PID	6 (13.1)
Vaginitis + PID + Cervicitis	10 (21.7)
Vaginitis + Cervicitis	10 (21.7)
Vaginitis + Cervical erosion	9 (19.6)
Vaginitis + Cervicitis + Cervical erosion	4 (8.7)
Asymptomatic women (n = 135)	
Vaginitis	5 (3.7)
Cervicitis	5 (3.7)
Cervical erosion	3 (2.2)

Only vaginitis was diagnosed in 10.9% cases and PID in 4.3% cases. PID along with vaginitis was detected in 13.1% and with vaginitis & cervicitis in 21.7% cases. Vaginitis and cervicitis in combination found in 21.7% and vaginitis and cervical erosion in 19.6% cases. Vaginitis, cervicitis & cervical erosion in combination detected in 8.7% of cases. In asymptomatic women vaginitis was found in 3.7%, cervicitis in 3.7% and cervical erosion in 2.2%.

TABLE: XXVIII**LABORATORY TESTS IN STUDY POPULATION**

Laboratory tests		Asymptomatic women (n =135) No. (%)	Symptomatic cases (n =46) No. (%)
Whiff test	Positive	2 (1.5)	8 (17.4)
Wet mount	Motile trichomonas	0 (0)	7 (15.2)
	Budding yeast cells	3 (2.2)	19 (41.3)
	Clue cells	2 (1.5)	8 (17.4)
Gram's staining	Budding yeast cells	3 (2.2)	19 (41.3)
	Clue cells	2 (1.5)	8 (17.4)
	Diplococci	0 (0)	1 (2.2)

Whiff test was positive in 17.4% women with RTI/STI syndromes and 2 women without complaints. Motile trichomonas was detected in 15.2% cases in wet mount and budding yeast cells 41.3% cases & 2.2% women without any complaints. Clue cells were detected in 17.4% women with symptoms in wet mount and 1.5% asymptomatics. In Gram's staining, budding yeast cells found in 41.3% smears of RTI/STI cases and 3 smears of women without any complaints. Clue cells were detected in 17.4% smears and diplococci in 1 smear by Gram's staining. VDRL test was negative in all subjects (n = 112) in which it could be done.

TABLE: XXIX**BACTERIOLOGICAL DIAGNOSIS**

Diagnosis	Asymptomatic women (n = 135)	In Syndromic cases (n = 46)
	No. (%ge)	No. (%ge)
Candidiasis	3 (2.2)	19 (41.3)
Gonorrhoea	0 (0)	1 (2.2)
Trichomoniasis	0 (0)	7 (15.2)
Bacterial vaginosis	2 (1.5)	8 (17.4)
Total	5 (3.7%)	35 (76.1)

Candidiasis was detected in 41.3% cases and bacterial vaginosis in 17.4% cases. Trichomoniasis was diagnosed in 15.2% cases and gonorrhoea in 2.2% cases. 23.9% cases could not be diagnosed by lab. tests. In women without any complaints, Candidiasis was diagnosed in 2.2% and bacterial vaginosis in 1.5% of women without any complaint. Bacteriological diagnosis could not be made in unmarried women. Syphilis was not detected in any of the study subjects (n=112). Syndromic diagnosis was confirmed with laboratory procedures in 35 cases, which is 76.1%.

AWARENESS OF STUDY POPULATION ABOUT RTI/STI

To assess the awareness, the study subjects were asked to cite some examples of STDs. When 89.6% named AIDS as one of the STDs, none of them gave the example of other classical STDs. 10.4% of them had no idea on STDs.

On further assessment, 88.8% revealed that these disorders are transmitted through sexual route, 22.8% through blood and only 2 women told that it could be transmitted from mother to child in the womb. 12% were silent regarding the mode of transmission of RTI/STI.

Regarding the common symptoms, only 8 (3.2%) respondents revealed that vaginal discharge is the common symptom, 2 respondents told that one might develop genital ulcer along with discharge. Only one told that there may be itching in the vulva along with discharge and ulcer. Most of the women were not aware regarding the common symptoms of RTI/STI.

Responding to an open-ended question regarding their awareness on different risk factors of RTI/STI, 12% of women did not reveal anything. 88% attributed multiple partners was the main cause, 73 (29.2%) of them opined that it may be multifactorial. The factors cited in addition to multiple partners were blood transfusion (8%), blood transfusion and infected syringes (14%), blood transfusion and sharing of needle, syringes, shaving blades (6.4%). Even two of them told that poor hygiene might be an additional factor.

75.2% of the study subjects were knew regarding the availability of RTI/STI services in the urban area.



DISCUSSION

The present study entitled, “An epidemiological study on RTI/STI among women of reproductive age group in urban slums of Brahmapur city” was carried out in slum areas of Brahmapur city from February 2004 to April 2006. The data analysis and compilation was done in the Department of Community Medicine, M.K.C.G. Medical College, Brahmapur.

The study was conducted in 10 Anganwadi areas at and near the Urban Health Centre Ankoli, which is the field practice area of Department of Community Medicine. The desired sample was decided proportionate to women in different age groups and systematic random sampling method was used to select the study subjects in each anganwadi area.

In the present study, all women examined were Hindu. Majority of them belonged to SEBC category (46.8%) followed by scheduled caste (32.8%) and general category (17.6%). 2.8% of study subjects were scheduled tribes. According to population census 2001, 97.1% of inhabitants of Brahmapur city are Hindu and 25.4% of the slum population belongs to scheduled caste and 0.33% scheduled tribe category.⁴³

The overall prevalence of RTI/STI in reproductive age group women was found to be 22.4% similar to the prevalence found in a study by **Nandan D et al** i.e. 27% of reproductive age group women in urban area.³²

Prevalence in different age groups was estimated that was maximum (55.5%) in the age group 25-34 years and minimum (14%) in the age group 15-19 years. In the study previously cited by **Nandan D et al**, prevalence of RTI/STI ranged from 4.13% in 15-19 years to 48% in 25-34 years women³² and in the study of **Pawanarkar J. and Chopra K.** (2002), RTIs were more prevalent in the age group of 26-30 years (33.9%).³⁰

RTI/STI was found to be more 42.9% and 23.2% in ST and SC group of women respectively than SEBC (22.2%) and general caste (18.2%); but there is no significant difference between General caste and backward castes.

In this study, the prevalence of RTI/STI cases observed to be significantly higher (30.8%) in illiterate women ($p < 0.02$). The similar results found in a study by **Pawanarkar J. and Chopra K.**, where the higher prevalence was found in illiterate group of women (42.9%).³⁰ Research has consistently shown that women's education is strongly linked to better reproductive health. Educated women use health care services much more than illiterate women. But no definite pattern was observed between RTI/STI and education of husband.

Prevalence of RTI/STI in different occupations is almost similar but only 5% of students were suffering from RTI/STIs. This may be due to rare exposure to sexual activity in students. But in the study by **Hawkes S. et al**, RTI/STI prevalence was 40% in women working outside home and 4.8% in housewives.³⁸ Prevalence of RTI/STI was almost equal in women with husbands of different occupations.

According to socio-economic class, 69.2% women belong to low and 30.8% to middle socio-economic class. RTI/STI syndromes found 24.9% of women of low social

class and 16.9% women of middle social class. In the study by **Pawanarkar J. and Chopra K.**, higher prevalence of RTIs found in women of lower strata of society(36%) compared to women from middle and higher income groups respectively.³⁰ In a study by **Parashar A. et al** in Shimla found a significant association RTI and per capita monthly income, more (69.2%) in respondents belonging to Class IV of Prasad's classification.³⁰

It was observed that 78.6% of the RTI/STI cases were present in women of nuclear family, 14.3% in the joint family and 7.1% in extended family which is more or less similar to the distribution of women in different types of families. Prevalence of RTI/STI in women of nuclear family was maximum (23.7%). **Rathore M. et al** in their study found women from nuclear families had more RTI (26.6%) than joint families (17.1%).³⁵ **Ram R. et al** in their study, reported prevalence of RTI to be minimum in small sized family and it gradually increases with the increase in the number of family members.³⁹

In the present study, a significant association ($p < 0.02$) was observed between RTI/STI and past history of such infection. This could be due to poor health seeking behaviour and low education of the slum women. Hence once infected could give rise to repeated infections.

RTI/STI was more prevalent in married women (26.3%) as compared to unmarried women. Marital status is significantly associated with RTI/STI ($p < 0.05$), which may be attributed to additional risk of sexual activities. **Rathore M et al** found only 1% of unmarried women had RTIs against 27.9% of married women ($P < 0.0001$).³⁵ **Parashar A**

et al also reported RTIs in 69.2% of married females against 2.5% of unmarried females.³⁰

RTI/STI cases observed to be higher when the age at marriage is less than 15 years or more than 25 years of age i.e. 40.9% and 50% respectively. In a study by **Chaubey D. et al**, they found that, a large majority (68.7%) of STD patients had their first sexual experience before the age of 20 years.³⁷ In the study by **Parashar A. et al**, most of the RTI cases had married at age < 15 years and a significant decrease in the prevalence as the age at marriage advanced.³⁰ RTI/STI in women married after 25 years can't be commented because the sample size is too small in this group. Prevalence of RTI/STI was more or less similar in different groups while considering the duration of married life.

Considering the parity wise distribution of cases, RTI/STI was found maximum i.e. 31.8% of study subjects having ≥ 4 children and 24.5% of women with less than 4 children. **Rathore M. et al** in their study found highest prevalence (44.9%) in grand multipara.³⁵ Repeated childbirth may be one of the routes for contracting infection. This contradicts to the study by **Nandan D. et al**, where prevalence was maximum i.e. 32% in urban women having one or two children.³²

RTI/STI syndromes found in 50% women with H/O abortion and 20.9% of women without such history within one year. The association between H/O abortion and RTI/STI was highly significant ($p < 0.001$). Abortion may be the outcome of prior infection or a cause of subsequent infection.

RTI/STI was found in maximum i.e. 40% of women using IUCD. No case of RTI/STI was found in women using barrier contraceptives. This parallels to the study by **Hawkes S. et al**, where 50% of IUCD users were having RTI/STI.³⁸ **Parashar A. et al** reported RTI prevalence to be 50.6% of terminal method users and 45.6% of IUD users and significantly low prevalence in women who use barrier methods.³⁰

Maintenance of hygiene was taken into consideration by assessing hygiene after intercourse, after urination and during menstrual cycle. In women with poor maintenance of hygiene, prevalence of RTI/STI was maximum i.e. 43.9%. Prevalence was 16.3% and 8.1% in women who practice average and good hygiene respectively. The difference between these groups was highly significant ($p < 0.001$). In a study by **Parashar A. et al** in Shimla, they found, the prevalence of RTIs was significantly high ($p < 0.001$) in those who were using any type of cloth whether clean or unclean.³⁰ In the study by **Hawkes S et al**, endogenous infections were found more commonly among Hindu than Muslim women. Whereas 31% of Muslim women changed their sanitary protection more than three times a day, only 15% of Hindu women did so ($P < 0.001$).³⁸

Two women giving positive history of STD in husband were found to be having RTI/STI and it was 25.4% in women not giving positive history. **Hawkes S. et al** in rural Bangladesh observed 15.4% of women with symptomatic husband had RTI/STI compared to 1.45% of women whose husband were having no symptoms.³⁸ Due to very small number of study subjects in this group, it can't be comparable.

Most common syndrome found in women was vaginal discharge in 96.4% followed by lower abdominal pain 39.3%, inguinal swelling 3.6% and genital ulcer 1.8%. This

parallels to the study by **Nandan D. et al**, where commonest symptom of RTIs/STDs was vaginal discharge (94%) followed by lower abdominal pain (55%).³² According to **Srivastava A. et al**, vaginal discharge was found 43.48% in urban slums.³³ **Thakor H.G. et al**, most common syndromic diagnosis was genital discharge syndrome- GDS (51.3%), followed by pain in lower abdomen (20.2%), enlarged inguinal lymph nodes (11.8%) and genital ulcer syndrome GUS (5.9%).²⁹

In this study, in maximum (53.7%) cases, the discharge was watery in nature followed by curdy discharge (24.1%). In 12.9% cases, the discharge was purulent. Mixed discharge found in 9.3% cases. This is similar to the study by **Srivastava A. et al**, in which maximum women were having watery discharge (64.08%) followed by curdy discharge (29.13%) and 4.85% women had mixed discharge.³³

The most common associated symptom with RTI/STI in the present study was itching of vulva (42.85%) followed by backache (28.6%). Burning micturation found in 3.57% RTI/STI cases. In 1.8% of cases, were complaining pain during intercourse and same proportions of women were associated with pain during micturation. Multiple symptoms observed in 14.3% of cases. But according to **Nandan D. et al**, backache (70%) was the most common associated symptom followed by vulval itching (49%).³²

Vaginitis was diagnosed in 10.9% cases and PID in 4.3% cases. PID along with vaginitis was detected in 13.1% and with vaginitis & cervicitis in 21.7% cases. Vaginitis and cervicitis in combination found in 21.7% and vaginitis and cervical erosion in 19.6% cases. Vaginitis, cervicitis & cervical erosion in combination detected in 8.7% of cases. According to a study by **Rathore M. et al**, PID was the commonest RTI (15.7%), followed

by vaginitis (11.3%), whereas, cervicitis and cervical erosion were 4.2% and only 0.2% women had genital ulcer.³⁵

In the present study, Candidiasis was detected in 33.9% cases and bacterial vaginosis in 14.3% cases. Trichomoniasis found found in 12.5% cases and gonorrhoea in 1.8% cases. In women without RTI/STI, Candidiasis was diagnosed in 1.54% and bacterial vaginosis in 1.03% of women. Other organisms could not be diagnosed due to limited diagnostic facility in the field conditions. In a community study from India, **Bang RA et al** found that 11% had syphilis, 0.3% had gonorrhoea, 14% had trichomonal vaginitis, 62% had bacterial vaginosis, 34% had candida vaginitis and 24% had pelvic inflammatory disease.²⁶ **Pawanarkar J. and Chopra K.** in their study found Bacterial vaginosis (63.3%) to be most common followed by candidiasis (25%) and Trichomonal vaginitis (11.7%).³⁰

Regarding the awareness, 89.6% named AIDS as one of the STDs, none of them gave the example of other classical STDs. 10.4% of them had no idea on STDs. 88.8% revealed that these disorders are transmitted through sexual route, 22.8% through blood and only 2 women told that it could be transmitted from mother to child in the womb. 12% were silent regarding the mode of transmission of RTI/STI. This shows that the study population was oriented towards AIDS only.

3.2% respondents revealed that vaginal discharge is the common symptom, two respondents told that one might develop genital ulcer along with discharge. Only one told that there may be itching in the vulva along with discharge and ulcer. Most of the women

were not aware regarding the common symptoms of RTI/STI. This may be attributed to the low level of education of the slum women.

Regarding their awareness on different risk factors of RTI/STI, 12% of women did not reveal anything. 88% attributed multiple partners was the main cause, 73 (29.2%) of them opined that it may be multifactorial. The factors cited in addition to multiple partners were blood transfusion (8%), blood transfusion and infected syringes (14%), blood transfusion and sharing of needle, syringes, shaving blades (6.4%). Even two of them told that poor hygiene might be an additional factor.

75.2% of the study subjects were knew regarding the availability of RTI/STI services in the urban area.



SUMMARY & CONCLUSION

The results and analysis of the study on RTI/STI among women of reproductive age group in urban slums are summarized as follows.

- Prevalence of RTI/STI among women of reproductive age group is 22.4%, which was maximum in 25-29 years and in backward castes.
- The prevalence of RTI/STI cases observed to be higher in illiterate women (30.8%).
- Distribution of cases according to social class reflects that more women of low social class (24.9%) were suffering from RTI/STI.
- Prevalence of RTI/STI was 26.3% in married women and marital status was significantly associated.
- In women with poor maintenance of hygiene, prevalence of RTI/STI is maximum i.e. 43.9%. Prevalence was 16.3% and 8.1% in women maintaining average and good hygiene respectively. The difference between these groups was highly significant ($p < 0.001$).
- Most common syndrome found in RTI/STI cases was vaginal discharge in i.e. 96.4% followed by lower abdominal pain 39.3%, inguinal swelling 3.6% and genital ulcer 1.8%.
- Laboratory diagnosis was confirmed in 76% of syndromic cases.

- Awareness about RTI/STI was not satisfactory. Most of the women refer to AIDS as the RTI/STI.
- According to 88.8% women sexual route is the predominant mode of transmission.
- About 25% did not know about the availability of RTI/STI services.



RECOMMENDATIONS

The findings of this study will serve as a baseline data for further exploration of prevalence of RTI/STI in urban areas along with its determinants.

- The women should be made aware about the hygienic practices to prevent RTI/STI.
- Education of adolescent girls on menstrual hygiene and sexual hygiene should be carried out.
- Women should be educated about the major syndromes of RTI/STI and to report early to health system.
- Thrust should be given on RTI/STI component while providing RCH services in urban area especially in slums.
- RTI/STI services in urban areas should be strengthened by integrating these with other supportive health services.



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SCHEDULE

Serial no.-
Date:
Household no.-

Name: Name of Head:
Age: Address:
Religion: Hindu/Muslim/Christian/Others
Caste: ST/SC/SEBC/General
Type of family: Nuclear/ Joint/ extended
Marital status- married/ unmarried/Widow/Divorcee
If married, Duration of marriage
Education: (Specify) Education of husband: (Specify)
Occupation: (Specify) Occupation of Husband: (Specify)
Income of family: (monthly income from all sources):
Per capita monthly income:
Obst. History: Para- Gravida-
If pregnant, gestational age (in weeks)-
LCB-
Abortion (with in one year) - Y/N If yes, when-
Postnatal period--Y/N, If yes, no. of weeks-
Use of Contraceptives-Y/N
If yes- IUCD/ OCPs/ injectables/norplant/Condoms/Permanent method
Intravaginal application if any- Medication/ Others (Specify):
H/O Menstrual hygiene-
Using sanitary napkins-Y/N, If no, whether it is clean, sundried/
illmaintained
Cleaning private parts during periods- Y/N
H/O Genital hygiene-
Urination- Site- Bathroom/ open field/ other
Cleaning private parts after urination- Y/N

Defecation- Sanitary latrine/ open field/ other

Bathing- Bathroom/ Pond/ other

Sexual history-

Husband/ other/ Multiple partner

Sexual hygiene- Cleaning genital organs after intercourse/ Not

Pain during intercourse -Y/N

Bleeding during intercourse -Y/N

Sexual activity during menstrual period- Y/N

All these things we discuss with you to prevent infection in a women.

Do you know, what are the symptoms of RTI/STI? (Specify)

(If does not know, then explain the symptoms)

Previous H/O symptoms of RTI/STI- Y/N

If yes, What(specify)

When-

Duration of morbidity-

Treatment taken- a) Self-Y/N

b) Partner- Y/N

H/O present illness:

Symptom of RTI/STI- present/absent

1) Vaginal discharge- Yes/ No

If yes, Nature - watery/purulent/curd like/ mixed

Smell- Foul smelling/not

Amount- Scanty or Profuse

Associated with burning micturation-Y/N

Pain during micturation- Y/N

Associated with itching in vulva-Y/N

Duration of discharge-

2) Genital ulcers- Yes/ No

If yes, unilateral/bilateral

Associated with pain- Y/N

Associated with bleeding- Y/N

- 3) Lower abdominal pain- Yes/ No
4) Inguinal Swelling- Y/N
 If yes, unilateral/ bilateral
5) Genital growth- Y/N
6) Backache- Yes/No

H/O Partner:

Urethral discharge - Y/N

Burning micturation-Y/N

Genital ulcers- Y/N

 If yes, unilateral/bilateral

 Associated with pain- Y/N

 Associated with bleeding- Y/N

 Inguinal swelling- Y/N

Examination

General Examination

Fever- present/absent

Pallor- present/absent

Lymphadenopathy(Sp.inguinal) - present/absent

CVS-

Resp. System-

Specific Examination

Groins- Nodes-enlarged/not

Vulva- Ulcer/ Healthy

Pubic area- lice/Sores/Others/No specific findings

Perineum – Rashes/ Sores/Warts/Swellings/Other/ No specific findings

Per vaginal examination -

Urethral discharge- Present/ absent

Vaginaldischarge - Present/ absent

if present -watery/purulent/curd like / mixed

 Smell- Foul smelling/not

Cervix – tender on moving / not

Per speculum examination-

Tenderness- Present/ Not

Vagina- Erythma/Discharge/Ulcers/Warts/Healthy

Cervix- Bright red (Bleeding on touch)

Mucopus

Urethral discharge- Present/ Not

Lab. Examination

Examination of vaginal fluid-

1. Whiff test (Addition of KOH to vaginal smear)-

Fishy amine odour – present/ not

2. Direct microscopy of wet mount-

Motile Trichomonas - present/not

3. Gram's staining-

Budding yeast cells -present/absent

Clue cells- present/absent

Diplococci- present/absent

Blood examination for Syphilis (VDRL)- + ve/-ve

Treatment History: Taking/not If taking, Where –

Self-Y/N

Partner-Y/N

DIAGNOSIS:

Name some STDs-

What are the risk factors for RTI/STI?

How RTI/STIs are transmitted?

Knowledge of women about RTI/STI services- Y/N