3. REPRODUCTIVE TRACT INFECTIONS

Reproductive Tract Infections (RTIs) including sexually transmitted infections (STIs) and HIV/AIDS are being increasingly recognised as a serious public health problem. RTIs cause suffering both to men and women, but their consequences are far more devastating and widespread among women. Among women, RTIs often go undiagnosed and untreated, pelvic inflammatory disease, ectopic pregnancy, miscarriage, cervical cancer, and an increased risk of HIV transmission. Adolescents too are vulnerable to RTIs due to their ignorance of risk factors, inadequate accessibility to services and social powerhouses. A number of studies have been initiated to cover the epidemiological, clinical and diagnostic dimensions of RTIs.

3.1 Association of Chlamydia trachomatis infection and Host Genetic Factors in Manifestation of Reproductive Complications

Principal Investigator: Jayanti Mania-Pramanik
Project Associates: Shilpa Kerkar, Shobha Potdar, Pratibha Mehta, UM Donde
Project Collaborators: Vinita Salvi, Seth G.S. Medical College and KEM Hospital, Parel, Mumbai

Duration: 2003-2006

The immune response of host to infections is believed to be an important determinant in the manifestation and progression of associated disease. A high individual variability in relation to manifestations of symptoms following infections suggests an influence of host factors. Genes of the major histocompatibility complex (MHC) or the human leucocyte antigen (HLA) are known to control many immune responses. Sexually transmitted infections are mostly asymptomatic but the sequelae of these infections are well established. Our study on Chlamydia trachomatis infection has shown that most of the infected subjects are asymptomatic (Annual Report 2002-03, p 79). Hence, it is important to understand the mechanism associated with host genetic factors and the development of pathogenesis that may help to establish appropriate preventive measures following these infections.

The objectives of this study are to (i) establish HLA polymorphism among infected cases with different clinical manifestations, and (ii) evaluate the influence of the host genetic factors on the reproductive outcome of infected cases.

Molecular typing of HLA has been standardized using high-resolution polymerase chain reaction / sequence specific oligonucleotide hybridization (PCR-SSOP). The hybridization probes are selected manually using pattern-
matching program. These selected probes are then analyzed using software specific for these probes and the alleles are interpreted. For the study, 224 subjects with different manifestations have been enrolled, and screened for different reproductive tract infections. Infections were detected in 77 subjects, Chlamydia trachomatis infection was observed in 17 subjects. Subjects with bad obstetric history (n=2) and infertility (n=2) showed the presence of anti-chlamydia IgG antibodies, indicative of past infection. Five healthy volunteers and 11 subjects with different infections and manifestations are being analyzed for HLA alleles.

Enrollment of defined subjects is in progress to establish the association of host genetic factors with infections in reproductive complications.

### 3.2 Reproductive Tract Infections: Clinical and Microbiological Study in Women (Partly funded by WHO Country Budget)

**Principal Investigator:** Kamal Hazari

**Project Associates:** Shanta Chitlange, Rashmi Shah, Lalita Savardekar, B.N. Mali, Vrushali Palayekar, Pramodini Phatak, Dipika Belekar, Rachana Dalvi, Vidya Shenoi, A.M. Chandorkar, P.D. Khopkar, S. Shaikh and A. Hankare

**Duration:** 2002-2006

Reproductive tract infections (RTIs) especially sexually transmitted infections (STIs) cause a wide spectrum of pathology in women, which includes vaginitis, cervicitis, endometritis, salpingitis, pelvic inflammatory disease (PID), ectopic pregnancy (EP), infertility and also prematurity, stillbirth; conjunctivitis and pneumonia in the neonates. RTIs are a serious concern in the era of HIV since even the non-ulcerative STIs increase the risk of HIV transmission by 3-5 folds. It is the burden of asymptomatic disease that is responsible for the frequent and severe or longterm morbidity (PID/EP/infertility) and in part for the persistence and spread of STIs in the communities.

The objectives of the study are to (i) to evaluate the relationship between clinical manifestations and microbiological diagnosis of common RTIs (bacterial vaginosis, candidiasis, trichomoniasis and chlamydia trachomatis) in women at low risk for RTIs; and (ii) evaluate the therapeutic response as assessed by clinical and microbiological tests.

Women attending the NIRRH Family Welfare clinics, were enrolled, their detailed clinical history taken and gynaecological examination was carried out. Women with pregnancy, concurrent systemic diseases or those receiving
immunosuppressants, antibiotics were excluded. Investigations was carried out to identify the infections were, vaginal pH, Whiff test (10% KOH), wet vaginal smear, Papanicolaou smear and endocervical smear (for DFA for chlamydia trachomatis)

The women were grouped as follows: **Group A:** Evidence of RTIs on clinical examination – women were offered treatment at the initial visit; **Group B:** Subclinical evidence of RTIs, these women were offered treatment on basis of the laboratory investigations at a subsequent visit; male partners were treated for chlamydia and trichomonal infection identified in the women (groups A and B); **Group C:** No evidence of RTIs by clinical or laboratory investigations (control group). A total of 616 women have been enrolled and screened. Of these, 558 were enrolled while 58 were excluded for reasons as shown in the Fig. 78.

![Exclusion criteria](image_url)

**Fig. 78: Exclusion criteria**

Of the women enrolled for the study, 90 were in group A; 151 in group B and 317 women as controls in group C.

The study has been completed in 450 women and their results are as shown in Tables 7,8,9 below.

The women were from a lower middle socio-economic background, married, parous and majority were housewives.

Majority of women 97.7 percent and 95.9 percent husbands had monogamous relationships. Majority of the women 76 percent reported no history of RTIs in the last 12 months.
Table 8: Percent prevalence of symptoms

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Menorrhagia</td>
<td>6.4</td>
</tr>
<tr>
<td>White discharge</td>
<td>41.0</td>
</tr>
<tr>
<td>Muco-purulent discharge</td>
<td>5.4</td>
</tr>
<tr>
<td>Pruritis</td>
<td>21.2</td>
</tr>
<tr>
<td>Pain, lower abdomen</td>
<td>13.9</td>
</tr>
<tr>
<td>Dysmenorrhoea</td>
<td>16.5</td>
</tr>
<tr>
<td>Dyspareunia</td>
<td>4.2</td>
</tr>
<tr>
<td>Urinary complaints</td>
<td>5.0</td>
</tr>
</tbody>
</table>

Table 9: Positive clinical findings

<table>
<thead>
<tr>
<th>Clinical finding</th>
<th>Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local inflammation</td>
<td>1.8</td>
</tr>
<tr>
<td>Boils</td>
<td>0.5</td>
</tr>
<tr>
<td>Abscess</td>
<td>0.5</td>
</tr>
<tr>
<td>Discharge</td>
<td>17.2</td>
</tr>
<tr>
<td>Cervicitis</td>
<td>9.2</td>
</tr>
<tr>
<td>Nabothian follicles</td>
<td>4.2</td>
</tr>
<tr>
<td>Erosion cervix</td>
<td>17.1</td>
</tr>
<tr>
<td>Other lesions</td>
<td>7.4</td>
</tr>
<tr>
<td>Uterine tenderness</td>
<td>5.6</td>
</tr>
<tr>
<td>Adnexal tenderness</td>
<td>1.4</td>
</tr>
</tbody>
</table>

Table 10: Pap smear and DFA for Chlamydia trachomatis

<table>
<thead>
<tr>
<th>Test</th>
<th>Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inflammation</td>
<td>65.4</td>
</tr>
<tr>
<td>CIN I</td>
<td>0.5</td>
</tr>
<tr>
<td>Normal</td>
<td>34.1</td>
</tr>
<tr>
<td>Bacterial vaginosis</td>
<td>11.6</td>
</tr>
<tr>
<td>Candida</td>
<td>7.4</td>
</tr>
<tr>
<td>HPV changes</td>
<td>10.7</td>
</tr>
<tr>
<td>Positive DFA for C. Trachomatis</td>
<td>16.0</td>
</tr>
</tbody>
</table>

The study is ongoing and final analysis will be carried out on completion of assessment in the participating women.
3.3 Purification and Characterization of CD4 independent 160kDa Sperm Receptor for HIV

Principal Investigator: A.H. Bandivdekar

Project Associates: Vijaya Raghavan, Shilpa Velhal, Jacintha Pereira, S. D. Rawool and R. B. Kadam

Duration: 2002-2006

Human Immunodeficiency Virus (HIV) has been demonstrated to bind and enter the spermatozoa. HIV infected spermatozoa has also been shown to facilitate the transmission of HIV into urogenital cell as well as transmit virus into the oocyte. However spermatozoa have been reported to be devoid of the conventional CD4 receptor suggesting the existence of alternate receptors for HIV on the sperm surface. In an attempt to identify the HIV receptor on spermatozoa, a 160 kDa HIV binding protein has been identified by Western blot technique using both cell free HIV as well as gp120 HIV envelope glycoprotein (Annual Report 2002-03, p 82).

The protein has been partially purified from human sperm extract by ion exchange chromatography on Mono Q column, followed by chromatofocusing using Mono P column to obtain a homogenous 160 kDa protein (Annual Report 2002-03, p 83).

A cDNA clone encoding 160 kDa HIV binding protein has been isolated by immunoscreening a human testicular λZAP cDNA library using gp120 protein and antibody to gp120. PCR amplification of the positive clone using T3 and T7 primers resulted in 1kb fragment which is currently being sequenced.

3.4 Nisin: The Antimicrobial Peptide for the Control of Fertility and Sexually Transmitted Infections (Funded by Indian Council of Medical Research under Microbicides)

Principal Investigator: K.V.R. Reddy

Project Associates: Clara Aranha, Sadhana Gupta

Collaborator: Sujatha Baveja, Seth G S Medical College and K.E.M. Hospital, Parel, Mumbai

Duration: 2001-2006

Over the past decade, there has been an escalating rise in unwanted pregnancies and sexually transmitted infections (STIs) including human immunodeficiency virus (HIV) infection. Therefore studies were initiated to develop prophylactic contraceptives that will offer optimal strategies for fertility control and protection against STIs/HIV.
Nisin, a food preservative and an antibacterial peptide was evaluated for its antifertility effect. Intravaginal administration of 1mg Nisin was found to block conception in rabbits. Studies on the bioavailability of Nisin in the vaginal lavage and its effect on fertility revealed that even when the mating is delayed by an hour, the contraceptive effect is still present (Annual Report, 2002-2003, pg 88). 50 mg Nisin administered intravaginally for 14 consecutive days did not induce abnormalities either in the morphology of vaginal epithelial cells or structural integrity of the vaginal epithelium. Nisin has also been shown to inhibit the growth of standard strains, clinical isolates and multi-drug resistant organisms such as E. coli, S. aureus, P. aeruginosa, C. albicans and C. tropicalis (Annual Report 2002-2003, p 88).

Nisin gel formulation

During the year, studies were initiated to develop a suitable gel formulation of Nisin using various gelling agents viz., Carbopol, Hydroxypropylmethyl cellulose (HPMC), Lutrol or their combination. Of the several gels prepared, a formulation containing 0.5% Carbopol with 5mg Nisin showed significant spermicidal activity in-vitro in rabbits (90% in 10 min). Three groups of three rabbits each to whom the gel formulation was applied intravaginally were allowed to mate after 10min (group 1), 30min (group 2) and 60min (group 3) following application. Except for two animals in group 3, the remaining animals conceived, indicating delayed release of Nisin from the gel. Preparation of a suitable gel formulation with faster release of Nisin is under progress.

Mechanism of action of Nisin

i) Transmission electron microscopic studies

Nisin was observed to be spermicidal in its action on human spermatozoa (Annual Report 2001-2002, pg 88). However the mechanism by which Nisin interacts with sperm and causes spermicidal effect is not known. Transmission electron microscope (TEM) studies revealed significant changes in the ultra structure of spermatozoa after treatment with 300µg Nisin for 5 min. The changes include blebbing of the plasma membrane, loss of acrosome intactness, dense and vacuolated nuclear chromatin, vacuolated mitochondria and absence of cristae elements (Fig. 79).
ii) Liposomes as model membranes to study the action of Nisin on cell membrane

Lipids are known to regulate the physico-chemical properties of cell membranes. These membranes contain several lipids with varying polar groups and hydrophobic moieties. Aqueous dispersion of lipids leads to formation of closed bilayers and can act as models for biological membranes. In the present study, we investigate the mode of interaction and membrane permeating properties of Nisin using lipid vesicles. Various liposome vesicles were prepared using different phospholipids viz., phosphotidylcholine (PC), phosphotidylethanolamine (PE) and phosphotidylglycerol (PG), mimicking membranes of various cells such as spermatozoa, RBC’s, vaginal cells and bacteria. Three liposome model membranes were prepared. 1) PC bilayer membrane abundantly present on RBCs (neutral charge). 2) PE and PG bilayer membranes (negative charge) which serve as models for the plasma membrane of spermatozoa and bacterial cells.

The lipid film formed after the evaporation of organic solvents was dried overnight under vacuum. Unilamellar vesicles (ULVS) were prepared with a Liposofast extruder by passing the vesicles through polycarbonate filter with 100 nm pore size (Fig. 80).
iii) **Nisin binding to liposomes and leakage of calcein**

For preparation of calcein entrapped ULVs, 70 mM calcein was added to the dried lipid film. Untrapped calcein was removed from the vesicles by gel filtration on a sephadex G-75 column. The pore forming activity of Nisin was assayed on the basis of calcein release from ULVs. Approximately $10^4$ ULVs were incubated with different concentrations of Nisin at 30°C for 10 min. The efflux of calcein from the vesicles was measured fluorometrically at an excitation wavelength of 490 nm and an emission wavelength of 520 nm. The values were expressed as Nisin /lipid ratio at which 50 per cent leakage was observed for the initial 5 minutes. Triton X-100 used as positive control, showed 100 per cent calcein leakage.

Membrane permeabilization was affected with increasing concentrations of Nisin. The leakage of calcein from PG and PE vesicles differed substantially from PC vesicles. PE and PG vesicles possess negative surface potential and attract the positively charged Nisin. In the Nisin/lipid ratios examined, PE and PG vesicles showed highest leakage and PC vesicles lowest (Fig. 81). The strong leakage could be attributed to either multiple pore formation by the peptide or strong hydrophobic interactions leading to irreversible membrane damage.

**Fig. 80: Effect of different concentrations of Nisin on liposome vesicles of PG (A, B,C) and PE (D,E,F).** (A, D = 10µg, B, E = 50µg and C, F = 100µg).
Fig. 81: Effect of different concentrations of Nisin on calcein leakage from liposome vesicles.

3.5 Identification, Purification and Characterization of Antifertility Compounds with Microbicidal Activities

Principal Investigator:  
**K.V.R Reddy**

Project Associates:  
R. D. Yedery, Clara Aranha and Smita Mahale

Collaborator:  
Sujata Baveja, Seth GS Medical College and K.E.M. Hospital, Parel, Mumbai

Duration:  
2001-2006

Antimicrobial peptides are cationic charged molecules and are part of the innate immune mechanism present in a wide range of organisms ranging from bacteria to humans. Earlier attempts to identify antimicrobial peptides/proteins from crabs led to the isolation of cationic peptides exhibiting antimicrobial and spermicidal activities (Annual Report 2002-03, p 88). Further purification using RP-HPLC with C4 column gave a single homogenous peak and two bands of 19 kDa and 12 kDa on SDS-PAGE (Fig 82). These proteins were sequenced by mass spectrometry. The mass-spec was able to recognize the sequence of two peptide fragments in case of the 12 kDa protein and four in case of the 19 kDa moeity. Synthesis of one of the peptide fragments (12 kDa protein) is in progress. The peptide will be used to generate antibodies which in turn will be used to identify the native protein present in the hemolymph.
3.6 Phase I: Expanded Safety and Acceptability Study of 6 per cent Cellulose Sulfate (Funded by CONRAD-WHO)

Principal Investigator: Kamal Hazari

Project Associates: Shanta Chitlange, Shubhangi Kalgutkar, Jayanti Mania Pramanik, Virginia Kiro, Chitra Thosar, Sunita Unde, Mangala Honawar, Prerna Gade and Nancy Masih

Collaborator: Maya Lulla, Consultant, Mumbai

Duration: 2002-2003

This is a multicenter study (CONRAD-WHO) with 2 centers in Africa and the third at this Institute with Dr. Issac Malonza as the WHO Co-ordinator.

Sodium Cellulose Sulfate (CS) is a non-cytotoxic antifertility agent which also exhibits antimicrobial activity in vitro against sexually transmitted pathogens. Animal and human studies suggest that it is minimally irritating to the vaginal epithelium.

Studies in rabbits showed mild vaginal irritation and in rats there was no irritation after a 14 day exposure to CS. A 6-day safety study during which 24 women vaginally applied either 2.5 ml (150 mg) or 5.0 ml (300 mg) 6 percent CS suggested that its safety was comparable to a marketed N-9 product.
(Conceptrol®) and an inactive control (K-Y® Jelly) tested in the same study and in addition, CS may be associated with less genital irritation.

A study implemented in the USA to ensure that male partners of women who use CS were not subject to an undue risk of penile irritation due to exposure to the product, confirmed safety to male partners. Therefore, this protocol has been implemented to assess the safety in one cohort of women applying the product twice daily for one week while abstaining from intercourse and in a second cohort of women who followed the same protocol but were requested to engage in intercourse.

A total of 180 women volunteers were enrolled, 60 at each center.

The objectives of the study were to i) determine and compare the effect of twice daily vaginal applications of 3.5 ml 6 per cent CS or K-Y® Jelly for seven consecutive days based on symptoms and signs of irritation of the external genitalia, cervix, and vagina, and epithelial disruption as seen on colposcopy in women when no intercourse is permitted ii) in women when intercourse is permitted iii) assess the changes in vaginal health by results of wet mount and gram stain in both the study populations, women abstaining from intercourse and women engaging in intercourse, iv) assess the acceptability of twice daily vaginal application of 3.5 ml 6 percent CS or K-Y® Jelly for seven consecutive days in both study groups.

A pre study site visit and investigators meeting to review in detail the study procedures, recruiting and screening procedures, a mid-study monitoring visit and a study closure visit were also conducted.

At this institute, a total of 60 women, thirty each in cohorts 1 and 2 completed the study. The field staff required to contact 493 women (potential subjects) of whom 110 women reported to the clinics for screening. Of these, 62 were eligible for enrollment. The acceptability was high (78% women) to such a product for protection against STIs and pregnancy and 95 per cent of these women said they would recommend its use to other women. The pooled data from the 3 centers shows 94 per cent compliance among all participants. The results of the twice daily vaginal applications of 6 per cent CS was found it to be safe and well tolerated as KY Jelly.

Further studies of effectiveness of CS in HIV and pregnancy prevention have been planned.
3.7 **Stigma Attached to HIV/AIDS: Implications for Health Care and Social Adjustment** (Funded by ICMR Task Force)

Principal Investigator: **S. L. Chauhan**

Project Associates: Ranjana Kaushal, Rashmi Jaydeokar and R Tadke

Duration: 2002-2003

With the broad objective of assessing the nature of stigmatization, discrimination and denial occurring in relation to HIV/AIDS in different settings and how it affects the individuals with HIV/AIDS in relation to seeking health care and social adjustment, a multi-centric study coordinated by ICMR, has been undertaken.

The preliminary findings of part of this study were highlighted in the last year’s report (Annual Report 2002-03 p 91-94). The study was completed during the current year on 91 HIV sero-positive/AIDS patients; 91 caregivers at hospital, at-home, counsellors and 426 household respondents representing general population. The findings based on the in-depth interviews of 91 persons living with HIV (PLWHIV) indicate that 39 (43%) have not revealed their sero-positive status to any of their family members at, workplace or in the community (Fig. 83).

![Fig. 83: Sharing of HIV positive status (n=91)](image)

The main reasons given were - fear of being thrown out of the house or the community; fear of loosing the job and that they do not want to be neglected. Fifty-two (57%) PLWHIV shared their HIV status with either of their spouse, parents, relatives and friends. The reaction at home was in the form of - did not believe, shocked; got scared; stopped talking; and frequent quarrels with verbal
or physical abuse. The community reacted by keeping distance; stopped inviting to social function; verbal abuse; and total neglect. In the health care facility setting, 50 percent PLWHIVs perceived sympathetic attitude, mostly from doctors while other respondents perceived negative reactions. The stigma related actions and reactions in the form of fear, anger and hate were experienced more at the hands of ward boys and ayahs.

Eighty percent employed (N=45) respondents have not revealed their HIV status at workplace, the reasons reported were fear of loosing the job, sarcasm and neglect. Regarding, modes of transmission as perceived by all the 91 respondents, 48 (40 males and 8 females, among them were 6 female sex workers) feel that they contracted the infection through high risk sexual behaviour and thirty-five female respondents, all being housewives feel that they were infected by their husbands. Blood transfusion is the reason for getting infected by the HIV virus as reported by five respondents (Table-11).

<table>
<thead>
<tr>
<th>Table 11: Perceived reasons for contracting HIV infection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reasons for contracting HIV</td>
</tr>
<tr>
<td>------------------------------</td>
</tr>
<tr>
<td>High risk behaviour</td>
</tr>
<tr>
<td>Through infected spouse</td>
</tr>
<tr>
<td>Infected blood transmission</td>
</tr>
<tr>
<td>Through razor</td>
</tr>
<tr>
<td>Through tattoo marker</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

Majority feel that better counselling, particularly post-test counseling should be provided not only for them but also for their family members, particularly to their spouse and close relatives. Other suggestions include support in terms of free medicines, government shelter homes, free education and food for their children.

The analyzed data has been submitted to the co-coordinating unit at the ICMR Headquarters, New Delhi. The report writing will be done for all the centers at ICMR Headquarters.
3.8 Capacity Assessment of Primary Health Care System in a District to deal with Reproductive Tract Infections

Principal Investigator: **S.L. Chauhan**

Project Associates: Beena Joshi, V Bhadoria and Neela Dharankar

Duration: 2002-2004

Community-based research on Reproductive Tract Infections (RTIs) in India has been restricted to assessing the prevalence among women and their health seeking behavior. However not much is known about the service delivery such as training status and training needs of the health functionaries and the essential facilities for quality service provision. The current study is focused on collection of information on the capacity of primary health care system to provide women with quality services for RTIs among women. Information on these aspects would help the primary health care system in providing the preventive, diagnostic, and treatment services for RTIs.

The overall objective of the study is to carry out a situational analysis of the primary health care system in a district, related to its capacity to provide quality services for reproductive tract infections among women. The specific objectives of the study are to (i) assess the knowledge, skills and attitudes of health functionaries towards RTIs in the primary health care system; (ii) assess the training needs and evolve modules for capacity building of the primary health care functionaries to deal with RTIs; (iii) assess the infra-structural facilities available for provision of RTI services in the primary health care system; and (iv) identify and recommend the provision of minimal essential facilities in the primary health care system for dealing with RTIs.

A facility survey of 20 PHCs and 24 subcenters and interviews of service providers working in the PHCs and subcenters (39 Medical Officers, 60 ANMs and 14 Laboratory Technicians) revealed the following major preliminary findings:

A total of 20 PHCs and 24 constructed Sub-centers were covered for facility survey in the study (60% of the Subcenters in the sample were not found to be constructed). The basic infrastructure facilities such as space, water, electricity and toilets at the PHCs were found to be adequate, however 73 per cent of the constructed Sub-centres had inadequate facilities. Though the PHCs were found to have ample space yet the audio-visual privacy was not present at 60 per cent of PHCs and the situation was worse at the Sub-centre level where it was almost non-existent (Fig. 84).
Only 15 per cent of the PHCs and 4 per cent of the sub-centers had a sign indicating availability of RTI/STI services. Generally curative services and family planning, maternal and child health services are available, while almost 100 percent referrals were done with regard to RTI/STI/HIV/AIDS services to the block or the district hospital.

The position of equipments like Microscope, Glass slides, Examination table, Refrigerator and Sterilizing equipments are satisfactory in the PHCs; however, other essential equipments for management of RTIs like burner lamps, centrifuge machine, gynecological torch etc. were not available or not in working condition in about 90 per cent of facilities (Fig. 85).

The supply of oral drugs in the PHCs was found to be quite good. Drugs like Norfloxacin, Ciprofloxacin, Doxycyline, Metronidazole, Ampicillin, and Co-trimoxazole were available in all the PHCs. Local anti-microbial vaginal creams were available in 40 per cent of PHCs. Only 20 per cent of PHCs had gram-staining reagents available for laboratory diagnosis of RTIs of which only 5 per cent of PHCs carry out laboratory diagnosis for RTIs/STIs using these reagents. 45 per cent of PHCs conduct syphilis test during antenatal care using VDRL kits. Routine and microscopic urine tests are also carried out at the PHCs. However, testing for HIV is not offered. As regard to the IEC material, apart from the common topics like ANC, PNC, Nutrition, Immunization, HIV/AIDS are available, only 16 per cent of PHCs have material like flip charts, brochures, posters, written messages on RTI focusing on women and only 5 per cent of PHCs have material on RTI focusing on men.
Among 39 Medical Officers (MOs) who were interviewed, 34 were serving at the PHC, while the remaining 5 were at the rural hospital. It was found that 50 percent of the MOs hold MBBS degree while the rest had BAMS qualification. Majority of MOs were males (82%), nearly half of them were young MBBS doctors having less than one year of experience. The interviews revealed that on an average 25–30 women and 20–25 men attend the OPD per day for general curative problems but for RTI/STI services the attendance was found to be very poor (only 1 man & 5 women per month). Majority of men coming to seek treatment for problems related to RTI complained of burning micturation followed by pruritus, urethral discharge and genital ulcer while most women complained of vaginal discharge & lower abdominal pain (Fig. 86).
MOs lacked the expertise in carrying out MTP and RTI/HIV treatment at the PHC particularly counseling services are not provided at 65 per cent of PHC’s for RTIs and 71 per cent for HIV/AIDS. The treatment for RTIs/STIs provided by most MOs is based on symptoms alone. As regard to the knowledge status of MOs about RTIs/STIs, only 15 per cent of them knew the difference between RTI and STI. It was found that all of them had good knowledge about the consequences that would arise in the absence of treatment for RTIs/STIs (HIV transmission 100 per cent, Infertility 35 percent, PID 15 percent, Cancer 9 percent and Vertical transmission 6%). However, in-depth knowledge such as on the utility of condom for dual protection of STIs and pregnancy and management of ‘at risk’ family planning client is lacking among more than 20 percent MOs (Fig. 87 a & b).
Fig. 87: Types of RTIs/STIs known to MOs (A). Family planning methods recommended to clients by MOs with RTI/STI & HIV/AIDS (B).
As regard to the training, most of the MO’s received RCH training during 1999-2001 for 10 days, and 3 days during Family Health Awareness Campaign, however only 29 per cent were satisfied with the training and the need for quality training was universally expressed.

A total of 60 ANMs were interviewed. ANMs were found to have considerable experience, 35 per cent of them had 16-20 years of experience. Though ANMs were not able to differentiate between RTI and STI yet they named the different types of RTIs/STIs such as AIDS, syphilis, candidiasis, and gonorrhea (Fig. 88 a & b).
They reported to receive women with common complains of vaginal discharge, lower abdominal pain, burning micturation, and pruritus. However, RTI services were poorly availed by men as only 0-4 men attend sub-centre clinic per month as against 0-12 women. The common antibiotics used by the ANMs to treat RTIs were Septran and Metronidazole. Sixty two per cent of the ANMs had received 2 days training during family health awareness campaign. ANMs were found to have comparatively better knowledge about the dual protection of condoms and management of ‘at risk ‘ family planning client.

A total of 14 Laboratory technicians were interviewed during the survey. Seventy nine percent of the Lab technicians had BSc, DMLT qualification. Common tests carried out by them include tests for TB, Urine (Sugar/Albumin), Haemoglobin, Malaria, VDRL, and Widal test (Fig. 89).
Though lab technicians lacked theoretical knowledge on RTI/STI, yet they knew that if left untreated RTI can create complications and can even lead to HIV transmission. As regard to their training status, 43 per cent technicians received training for one day on RTI/STI lab diagnosis, RTI orientation, HIV testing & sensitization on HIV transmission.