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The prevalence of reproductive tract infections in rural areas studied by the community based intervention programme

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***Abstract*---**In developing countries Reproductive tract infections are very important public health problem. RTI's that are not sexually transmitted are considered even more common.[2] These infections present major health, social and economic problems [3,4] A baseline study done among married young women in 1996–97 found a high prevalence of reproductive tract infections.[14] In response to the findings of this study, CHAD has adopted a comprehensive community based interventional strategy to reduce the burden of RTIs. Health education providing information on RTI's is provided to adolescents in school health programmes, out -Of-school youth and to young married couples. Regular mass education campaigns are held in the villages. The health team offers counseling on risk reduction both at the hospital and during home visits. In an attempt to expand health care services for early diagnosis and prompt treatment to the community level. Aim: To study the effect of a community - based intervention on the prevalence of reproductive tract infections in the community. Results: The total number of married women between the ages 15 - 25 years in Durgapur region from Gopalpur, Rajbandh and Panagargh villages were around 1740 participants. The number after exclusion was 1364 (78%). There were 5 health-aides in each arm. The eligible women were arranged according to their ID numbers and 50 –

60 women were selected from each health-aides area by stratified random sampling. Conclusion: Among the factors analyzed respondent's education was found to have a significant influence on RTIs. Symptomatic diagnosis was not very appropriate in diagnosing RTIs.

***Keywords*---**RTI's, UTI's, STI's, CHAD.

Introduction

Reproduction plays a central role in the lives and health of women in many parts of the world. In developing countries Reproductive tract infections are very important public health problem. WHO estimated that there were 340 million new cases of curable STI's throughout the world during 1999 in men and women aged 15- 49 years.[1] RTI's that are not sexually transmitted are considered even more common.[2] These infections present major health, social and economic problems [3,4] especially for women of a low socio- economic background. As STIs are known to increase the transmission of HIV, the control of these infections becomes even more crucial. Women's reluctance to discuss these matters, unbalanced gender relations, lack of decision making and a heavy work-load inhibit appropriate health seeking behaviour.[5, 6, 7] Poor quality care provided by inaccessible and insensitive health services are additional barriers.[8] Intervention efforts to prevent and control RTIs should take into consideration the full range of underlying factors that inhibit access to quality health care .[9]

The International Conference on Population and Development at Cairo in 1994 and the 1995 Beijing Women's Conference marked a critical transition in the approach to reproductive health. There was a shift from a primary emphasis on achieving country-level demographic targets to improving women's health through a wider range of sexual and reproductive health initiatives.[10] The Government of India's commitment to policy change following ICPD 1994 has recently resulted in a move towards the provision of comprehensive, integrated reproductive health care at all levels of the health sector.[8] The management of RTI's was incorporated into the RCH programme which aims to provide need based, client centered , demand driven, high quality and integrated services. Inspite of a strong commitment to comprehensive reproductive health care; control of STI's / RTI's in India continues to be inadequate.[12, 8] A district level household survey conducted in Karnataka, Kerala and Goa by the Population Research Centre at the Institute for Social and Economic Change showed a low level of awareness regarding RTIs.[13] There is an urgent need to develop and evaluate community based interventions aimed at reducing the prevalence of RTI's.

The Community Health and Development Programme of Gouri Devi Institute of Medical Sciences & Hospital, Durgapur, has been working closely with the community to improve its health and socioeconomic status, especially that of women. A baseline study done among married young women in 1996–97 found a high prevalence of reproductive tract infections. [14] In response to the findings of this study, CHAD has adopted a comprehensive community based interventional strategy to reduce the burden of RTIs. Health education providing information on

RTI's is provided to adolescents in school health programmes, out -Of-school youth and to young married couples. Regular mass education campaigns are held in the villages. The health team offers counseling on risk reduction both at the hospital and during home visits. In an attempt to expand health care services for early diagnosis and prompt treatment to the community level, village health-aides (female health workers) have been trained to diagnose and treat RTI's. Between April 2001 and July 2005, two alternative approaches to detect and treat RTIs in the community were tried.

The control of STIs takes on greater importance with the advent of HIV in the community. There has not been a recent prevalence study for RTIs in Kaniyambadi block. It was considered necessary to quantify the burden of RTIs in the community as part of the strategy to control HIV. The effectiveness of the community intervention also needed to be evaluated for further planning. Symptomatic prevalence was monitored by the field workers from 2001 to 2005 during the intervention period. Hence there was a need to measure prevalence using laboratory tests. A similar study was conducted in 1996 in the preintervention period. Comparison of the two studies would indicate the change in prevalence in the post- intervention period. If the intervention was found successful, similar education and health care efforts implemented on a wider scale could dramatically improve the health of young women.

Aims and Objectives

Aim: To study the effect of a community - based intervention on the prevalence of reproductive tract infections in the community.

Objectives:

1) To determine the prevalence of reproductive tract infections in the community.
2) To study the influence of multiple factors on the prevalence of reproductive tract infections.
3) To study the symptomatic prevalence of RTIs during the intervention period.
4) To compare the results with a pre intervention study done in 1996 – 97.

Methodology and Materials

Study Design: The study was a community based cross-sectional study.

Study Area: This study was conducted in Durgapur region from Gopalpur, Rajbandh and Panagargh villages. It is a drought prone area. Most villagers are agricultural labourers and some of them are marginal farmers and A significant number of young men are in the army. A few men go to other places for construction work and other jobs.

The Community Health and Development Programme of Gouri Devi Institute of Medical Sciences & Hospital, Durgapur has been working closely with the community to improve its health and socioeconomic status, especially that of women. A mobile clinic offering preventive and curative services visits each village every month. Patients who cannot be treated are referred to the base hospital

which offers secondary care services. If tertiary care is needed, patients are further referred to the Devi Institute of Medical Sciences & Hospital, Durgapur, where speciality care and advanced laboratory services are available.

Target Population

Ever married women between the age group of 15-45 years. Women who were pregnant or who had given birth in the previous 6 weeks were excluded due to greater susceptibility to vaginal candidiasis during this time. Others excluded were those who had temporarily or permanently moved out, who lived elsewhere as their husbands were in the army and those who lived in remote field huts as it was difficult to access them. The women who had menstrual periods on the day of examination were also excluded as they were unable to be examined.

Consent

Permission was sought from the village elders to conduct the study. The health-aide of the respective villages visited the women, explained the details of the examination, obtained their consent and invited them to participate.

Diagnostic Criteria Used

a) Trichomonas vaginalis: Criteria used: Positive culture of viable trichomonas vaginalis or positive wet mount preparation test.
b) Syphilis: Criteria used: Positive serology for rapid plasma reagin test.
c) Bacterial vaginosis: Criteria used : Nugent's scoring of 4 or above in patients with symptoms of vaginal discharge.
d) Candidiasis: Criteria used: Positive culture for Candida with the presence of curdy white discharge.
e) Chlamydia: Criteria used: Positive Polymerase chain reaction test for Chlamydia.
f) Gonorrhoea: Criteria used: Positive Polymerase chain reaction test for gonococcus.
g) Cervicitis: Criteria used: cervical erosion with purulent discharge from the cervix.
h) Pelvic inflammatory disease: Adnexal tenderness and / or the presence of tender adnexal mass on bimanual pelvic examination .

Statistical Analysis
Analysis of the data was performed using SPSS version 11.5.

Results

The total number of married women between the ages 15 - 25 years in Durgapur region from Gopalpur, Rajbandh and Panagargh villages were around 1740 participants'. The following were excluded : those who were currently antenatals or postnatals, those who had temporarily or permanently moved out, who lived elsewhere as their husbands were in the army and those who lived in remote field huts as it was difficult to access them. The number after exclusion was 1364 (78%).There were 5 health-aides in each arm. The eligible women were arranged

according to their ID numbers and 50 – 60 women were selected from each health-aides area by stratified random sampling. This list was given to the health-aides to invite the women to participate. 7 % were temporarily away from the village during the camp period and 48 of the remaining 494 refused to participate. Among the ones who responded 30 had menstrual periods during the camp period. They were unable to be examined and so were excluded. Hence the number who participated was 434 (94 % of those who were eligible). Of this number, 229 (94%) were from arm A and 205 (93%) were from arm B.

	Arm A	**Arm B**	**Total**
Total population	**962**	**778**	**1740**
Currently antenatal	18(2%)	22(3%)	40(2%)
Currently postnatal	66(7%)	54(7%)	120(7%)
Husband in army	30(3%)	40(5%)	70(4%)
Permanently moved out	8 (1%)	10 (1%)	18 (1%)
Remote Field huts	15 (2%)	15 (2%)	30 (2%)
Temporarily moved out	58 (6%)	42 (5%)	100 (6%)
Population after exclusion	769 (80%)	595 (77%)	1364 (78%)
Called to participate	278	254	532
Temporarily absent	16 (6%)	22 (9%)	38 (7%)
Eligible	262	232	494
Responded	248 (95%)	216 (93.%)	464 (94%)
Menstruation during camp period	19 (7%)	11 (5%)	30 (6%)
Participated	229/243 (94%)	205/221 (93 %)	434/464 (94%)
Refused	14 (5%)	16 (7%)	30 (6%)

Demographic features

The mean age for women in Arm A was 21.79 years (SD 1.9) and Arm B was 21.56 years (SD 1.9). The mean education was standard 7.8 (SD 3.1) for Arm A and 8.7 (SD 2.5) for Arm B. Other demographic and reproductive characteristics are given below. There was a larger percentage of farmers in Arm A. Women in Arm A also had more multiple pregnancies and tubal ligations.

	Arm A (n = 229)	Arm B (n = 205)	p value	Total (n = 434)
	number (%)	number (%)		Number (%)
Occupation			0.166	
Housewife only	154 (67 %)	153 (74 %)		307 (71 %)
Farmer	48 (21 %)	26 (13 %)		74 (17 %)
non agricultural labourer	20 (9 %)	22 (11 %)		42 (9.5 %)
salaried / small business	3 (1 %)	1 (5%)		4 (1 %)
Others	4 (2 %)	3 (1.5%)		7 (1.5 %)
Number of pregnancies			0.026*	
0	25 (11 %)	26 (13 %)		51 (12 %)
1	72 (31 %)	90 (44 %)		162 (37%)
2	93 (41 %)	69 (34 %)		162 (37%)
3 – 4	39 (17 %)	20 (9 %)		59 (14%)

Current contraceptive methods			0.002*	
None	122 (54 %)	133 (66 %)		255 (59 %)
tubal ligation	89 (39 %)	43 (21%)		132 (31 %)
IUCD	11 (5 %)	14 (7 %)		25 (6 %)
Oral pills	1 (0.4%)	3 (2 %)		4 (1 %)
Condom	5 (2 %)	8 (4 %)		13 (3 %)
Type of sanitary used			0.187	
Cloth				
Disposed	7 (3 %)	5 (2.5 %)	0.768	12 (3 %)
Reused	195 (85 %)	166 (81.5%)		361 (83 %)
Disposable napkin	27 (12 %)	33 (16 %)		60 (14 %)

* p value is statistically significant.

There were 74 abortions of which 61 were spontaneous and 13 were induced. Among the induced abortions 7 had dilatation and curettage, 2 had injections and 3 had tablets for induction. There were 101 (23 %) women with primary infertility. Demographic features for husbands are given below. Arm B had a larger proportion of men in the armed forces.

	Arm A	Arm B	p value	Total
Mean Age (SD)	30.9 (SD 4.4)	29.98 (SD 3.9)	0.211	30.5 (SD 4.2)
Mean Education	8.75 (SD 3.2)	9.1 (SD 2.9)	0.117	8.9 (SD 3.1)
Occupation			0.400	
Farmer	66 (29 %)	65 (32 %)		131 (30 %)
Labourer	51 (22 %)	37 (18 %)		88 (20 %)
armed forces	14 (6 %)	24 (12 %)		38 (9 %)
salaried / small business	19 (8 %)	15 (7 %)		34 (8 %)
transport workers	26 (11 %)	20 (10 %)		46 (11 %)
Others	52 (23 %)	42 (21 %)		94 (22 %)

Gynaecological Symptoms

The gynaecological symptoms reported by the participants are given below. There was more vaginal discharge reported in Arm A and this difference is statistically significant.

	Arm A	Arm B	p value	Total
Symptom	number (%)	number (%)		number (%)
vaginal discharge	75 (33 %)	48 (23 %)	0.031*	123 (28 %)
genital itch	10 (4 %)	16 (8 %)	0.132	26 (6 %)
dysuria	8 (3.5 %)	8 (3.9 %)	0.821	16 (4 %)
abdominal pain	19 (8 %)	11 (5 %)	0.229	30 (7 %)
any symptom	81 (35 %)	60 (29 %)	0.175	141 (32 %)

* p value is statistically significant

Partner's symptoms

These were reported by their wives. Many of them did not know if their partners had any symptoms. There were very few symptoms reported in comparison to the number of women who had symptoms.

	Arm A	Arm B	p value	Total
	number (%)	number (%)		number (%)
Does not know	17 (7.4 %)	13 (6.5 %)	0.719	30 (7 %)
No symptoms	207 (90.4 %)	179 (89.9 %)	0.878	386 (90.2 %)
Symptoms				
Urethral discharge	1 (0.4 %)	2 (1 %)	0.482	3 (0.7 %)
Penile ulcer	1 (0.4 %)	2 (1 %)	0.482	3 (0.7 %)
Dysuria	3 (1.3 %)	2 (1 %)	0.770	5 (1.2 %)
Inguinal swelling	0	1 (0.5 %)	0.283	1 (0.2 %)
Scrotal swelling	0	1 (0.5 %)	0.283	1 (0.2 %)

Clinical Diagnosis of RTI

Based on the clinical examination findings, the following diagnosis was made by the doctor. The difference was not statistically significant. The most frequent diagnosis made was trichomoniasis. There were very few women with a clinical diagnosis of pelvic inflammatory disease.

	Arm A	Arm B	p value	total
Endogenous infection				
Bacterial vaginitis	18 (8 %)	20 (10 %)	0.522	38 (9 %)
Candidiasis	16 (7 %)	10 (5 %)	0.332	26 (6 %)
Sexually transmitted infections				
Trichomoniasis	27 (12 %)	23 (11 %)	0.801	50 (12 %)
Cervicitis	12 (5 %)	6 (3 %)	0.213	18 (4 %)
Pelvic inflammatory disease	5 (2 %)	1 (0.5 %)	0.126	6 (1 %)
Any RTI	68 (30 %)	56 (27 %)	0.507	24(28 %)

Final Diagnosis of RTI

The final diagnosis was made based on a combination of laboratory and clinical findings. There were 19 culture samples positive for trichomoniasis and wet preparation picked up 2 more. Gram staining for bacterial vaginosis showed 69 samples with intermediate score and 104 samples with a high score. Women with a history of vaginal discharge in addition to an intermediate or heavy score on the gram stain were diagnosed to have bacterial vaginosis. Candida wet preparation showed 63 samples with yeast forms and 2 samples with mycelial forms. Candida culture yielded a heavy growth of organisms in 101 and moderate growth in 35. Clinical appearance of curdy white discharge and a positive culture was diagnosed as candidiasis.

Endogenous infections	Total
Bacterial vaginosis	54 (13 %)
Candidiasis	7 (2 %)
Total	61 (14 %)
Sexually transmitted infections	
Trichomoniasis	21 (5 %)
Chlamydia	2 (2 %)
Gonococcus	0
Syphilis	2 (0.5 %)
Any RTI	78 (18%)

Final Diagnosis of RTIs in Both Arms

Arm B had less infection than Arm A and this difference was statistically significant for total STIs and RTIs. None of the samples grew gonococcus; Chlamydia was present in just 1 person in each arm. Bacterial vaginosis was the commonest RTI. Among STIs the most common infection was trichomoniasis.

	Arm A	Arm B	p value	Total
Endogenous infections				
Bacterial vaginosis	35 (16%)	19 (9 %)	0.054	54 (13 %)
Candidiasis	4 (2 %)	3 (2 %)	0.815	7 (2 %)
Total	39 (17 %)	22 (11%)	0.055	61 (14 %)
STIs				
Trichomoniasis	15 (7 %)	6 (3 %)	0.079	21 (5 %)
Chlamydia**	1	1	0.887	2 (2 %)
Gonococcus***	0	0		0
Syphilis	2 (0.9 %)	0	0.180	2 (0.5 %)
Total	18 (8 %)	7 (3.4%)	0.047*	25 (5.7 %)
Any RTI	51 (22 %)	27 (13 %)	0.014*	78 (18%)

*p value is statistically significant, **done on 91 samples, *** done on 90 samples

The presence of symptoms reported was analysed against the final diagnosis of RTIs. Based on this, the sensitivity and specificity using symptoms as a predictor for RTIs was calculated.

	Symptomatic patients	Asymptomatic patients
	n = 141	n = 293
RTI present	59 (42 %)	19 (7 %)
STI present	11 (7.8 %)	14 (4.8 %)
Endogenous infection present	56 (39.7 %)	5 (1.7 %)
Trichomoniasis present	10 (7.1 %)	11 (3.8 %)
Bacterial vaginosis present	54 (38.3 %)	0
Candidiasis present	2 (1.4 %)	5 (1.7 %)

Using symptoms as a predictor for RTI, sensitivity was 75.6 %, specificity was 76.8% and positive predictive value was 42 %. Comparing the clinical diagnosis with the final diagnosis of that infection; it was found that for Trichomoniasis, the sensitivity was 55% and specificity was 90.4%; for bacterial vaginosis sensitivity was 11.5% and specificity was 91.4% and for candidiasis sensitivity was 85.7% and specificity was 95.2%.

Factors Influencing RTIs and STIs

Univariant analysis was done using variables which were potentially able to influence RTIs or STIs. Those variables with a p value less than 0.2 were used to construct a logistic regression model and variables that remained significant were determined.

Univariant Analysis

Discrete variables chosen were housewives without another occupation, the arm of intervention, presence of abortions, tubectomies done, number of pregnancies, use of sanitary napkins, husbands working in the armed forces or involved in transport or agricultural work, use of intrauterine device and respondents education. Continuous variables chosen were socio-economic status, respondent's age, husband's age and education and respondent's age at marriage.

RTIs

Variables with a p value of less than 0.2 were housewife, arm of intervention, tubectomy, sanitary napkins, agricultural work by husband, respondent's education, socioeconomic status and husband's education.

Variable	RTI (n)	No %	P - value	OR	95% min	95% max
Housewife Only	no = 126	29 (23%)	0.085*	0.683	0.381	1.068
	yes = 306	49 (16%)				
arm	A = 228	51 (22%)	0.014*	0.529	0.318	0.882
	B = 204	27 (13%)				
abortions	no = 358	65 (18%)	0.904	0.961	0.498	1.852
	yes = 74	13 (18%)				
tubectomy	no = 301	60 (20%)	0.124*	0.64	0.361	1.134
	yes = 131	18 (14%)				
no. of pregnancies	<2 = 51	8 (16%)	0.639	1.21	0.545	2.687
	>2 = 381	70 (18%)				
sanitary napkins	clt = 371	72 (19%)	0.079*	0.461	0.191	1.114
	disp = 60	6 (10%)				
army	no = 391	5 (13%)	0.4	0.66	0.249	1.748
	yes = 38	72 (9 %)				
transport	no = 385	72 (19%)	0.409	0.686	0.28	1.685
	yes = 44	6 (14%)				
agricultural work	no = 312	52 (17%)	0.171*	1.444	0.852	2.45
	yes = 116	26 (22%)				
IUCD	no = 408	73 (18%)	0.716	1.208	0.437	3.329
	yes = 24	5 (21%)				
Respondents education	< 8 = 226	51 (23 %)	0.012*	1.910	1.146	3.185
	> 8 = 204	27(13 %)				

Variable	RTI	N	mean	Std dev	SE	p value	OR	95%CI min	95%CI min
Sum Ses	no	353	10.46	3.372	0.179	0.095*	0.939	0.871	1.011
	yes	78	9.77	3.010					
Age	no	353	21.71	1.892	0.101	0.403	0.947	0.834	1.076
	yes	78	21.51	1.912					
Husb Age	no	348	30.44	4.184	0.224	0.697	1.012	0.955	1.072
	yes	77	30.65	4.406					
Husb Educatn	no	351	9.04	3.002	0.16	0.083*	0.935	0.866	1.009
	yes	78	8.36	3.531					
Age at Marriage	no	353	18.67	2.036	0.108	0.763	1.019	0.901	1.153
	yes	76	18.75	1.775					

* p value is less than 0.2

STIs

Variables with p value less than 0.2 were arm of intervention, use of sanitary napkins, husband working in the armed forces and respondents education.

Variable	**RTI (n)**	**No %**	**P - value**	**OR**	**95% min**	**95% max**
Housewife	no = 126	9 (7 %)	0.439	0.717	0.308	1.669
	yes = 306	16 (5%)				
Arm	A = 228	18 (8%)	0.047*	0.415	0.169	1.014
	B = 204	7 (3%)				
abortions	no = 358	23 (6%)	0.212	0.405	0.093	1.755
	yes = 74	2 (3%)				
tubectomy	no = 301	18 (6%)	0.795	0.888	0.362	2.179
	yes = 131	7 (5%)				
no. of pregnancies	<2 = 51	4 (9%)	0.503	0.685	0.226	2.083
	>2 = 381	21 (6%)				
sanitary napkins	clt = 371	24 (7%)	0.140*	0.245	0.033	1.846
	disp = 60	1 (2%)				
army	no = 391	25 (6%)	0.108*	-	-	-
	yes = 38	0				
transport	no = 385	24 (6%)	0.288	0.350	0.046	2.651
	yes = 44	1 (2%)				
agricultural work	no = 312	17 (5 %)	0.570	1.285	0.539	3.064
	yes = 116	8 (7 %				
IUCD	no = 408	25 (6 %)	0.212	-	-	-
	yes = 24	0				
Respondents education	<8 = 226	8 (4%)	0.111*	1.993	0.841	4.722
	>8 = 204	17 (7.5%)				

Variable	RTI	N	mean	Std dev	SE	p value	OR	95%CI min	95%CI max
Sum Ses	no	406	10.37	3.347	0.062	0.403	0.949	0.841	1.072
	yes	25	9.80	2.784					
Age	no	406	21.70	1.906	0.104	0.284	0.895	0.730	1.097
	yes	25	21.28	1.696					
Husb Age	no	400	30.41	4.176	0.046	0.205	1.060	0.969	1.161
	yes	25	31.52	4.857					
Husb Educatn	no	404	8.91	3.098	0.067	0.939	0.852	0.882	1.145
	yes	25	8.96	3.397					
Age at Marriage	no	405	18.71	2.008	0.111	0.368	0.905	0.752	0.965
	yes	24	18.33	1.659					

* p value is less than 0.2

Logistic Regression

The variables found to be statistically significant for RTIs in the logistic regression model using backward conditional command were tubectomy, respondent's education and arm of intervention. There were no variables that were significant for STIs.

RTI

	B	SE	p value	OR	95% CI min	95% CI max
Tubectomy	- 0.733	0.307	0.017	0.481	0.263	0.878
Respondents Education	0.672	0.272	0.013	1.959	1.150	3.335
Arm	- 0.657	0.271	0.015	0.518	0.305	0.881

STI : No variables were found to be significant

Health Seeking Behaviour

Of the women who had symptoms 70 (51%) sought treatment and 67 (49%) did not take treatment. Places or people approached for treatment were: Chad health aide 19 (4%), Chad peripheral clinic 3 (0.3%), Chad rti camp 8 (2%), Chad hospital 12 (3%), CMC hospital 3 (0.7%), government camp 1 (0.2%), government vhn 3 (0.7 %), government PHC 5 (1.2%), government hospital 7 (1.6%), qualified practitioner 12 (3%), unqualified practitioner 1 (0.2%) and traditional practitioner 1 (0.2%). Reasons given for not taking treatment were : treatment not necessary 8 (1.8%), very minor 20 (5%), recent onset 10 (2.3%), lack of money 3 (0.7%), lack of time 11 (2.5%), shyness 11 (2.5%) and lack of confidentiality 8 (1.8%).

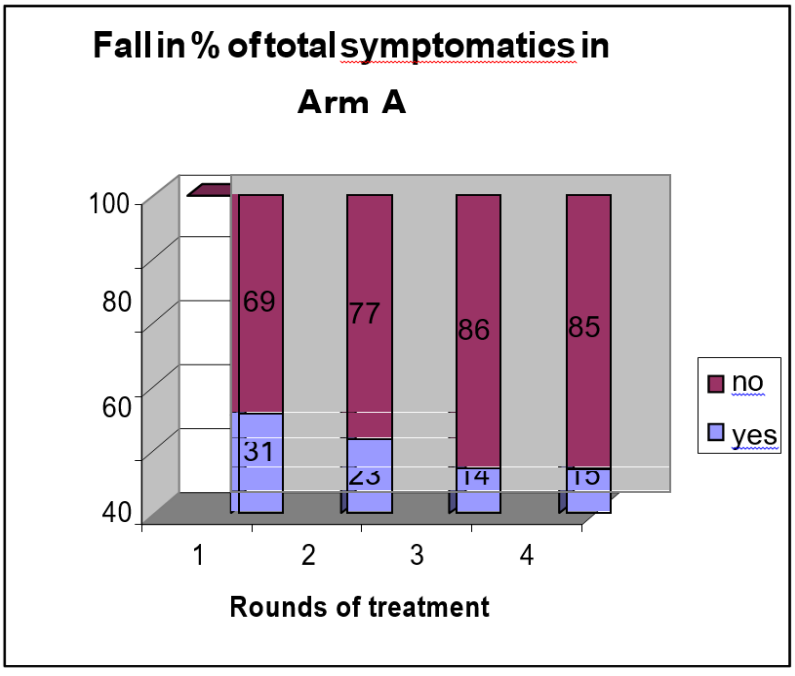
Monitoring of Symptomatic Prevalence

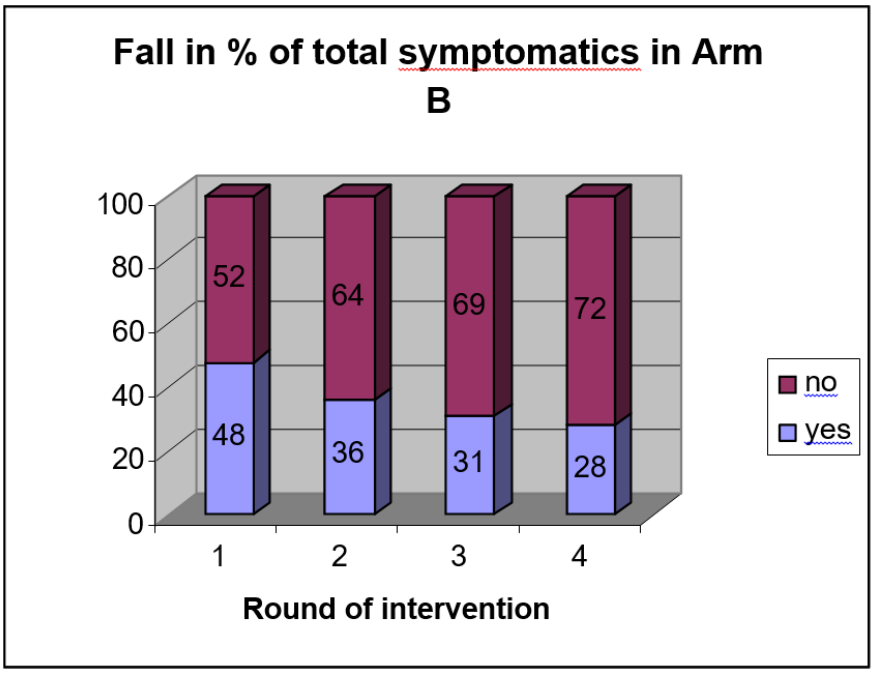
Symptoms were monitored by the field workers over the intervention period from 2002 to 2005.Women who were symptomatic were examined and a clinical diagnosis was made. There has been a declining trend in the number of symptomatics in both arms. However symptom of abdominal pain has increased in arm B. Reproductive tract infections diagnosed clinically have also dropped except for bacterial vaginosis in Arm B.

Variable	2002	(1st)	2nd		3rd		4th	
	A	B	A	B	A	B	A	B
	N	N	N	N	N	N	N	N
Total Target	2292	2294	2292	2294	2292	2294	2292	2294
No interviewed	2155 (94%)	2072 (90%)	1809 (79%)	1942 (85%)	1844 (80%)	2032 (89%)	2030 (89%)	2032 (89%)
Total symptomatic	672 (31%)	998 (48%)	409 (23%)	690 (36%)	258 (14%)	634 (31%)	305 (15%)	566 (28%)
Examined among symptomatic	502 (75%)	545 (55%)	261 (64%)	300 (43%)	135 (52%)	195 (31%)	189 (62%)	258 (46%)
Treated among symptomatic	404 (80%)	300 (55%)	221 (85%)	210 (70%)	114 (84%)	101 (52%)	162 (86%)	129 (50%)

Symptoms	no. (%)	no.(%)	no. (%)	no. (%)	no. (%)	no. (%)	no. (%)	no. (%)
Vaginal discharge	637 (30%)	861 (42%)	386 (21%)	673 (35%)	246 (13%)	624 (31%)	288 (14%)	545 (27%)
Genital itch	93 (4%)	96 (5%)	62 (3%)	134 (7%)	32 (1.7%)	74 (4%)	60 (3%)	106 (5%)
Dysuria	31 (1.4%)	60 (3%)	16 (0.9%)	66 (3%)	6 (0.3%)	38 (2%)	6 (0.3%)	50 (2.5%)
Abdominal pain	105 (5%)	41 (2%)	55 (3%)	105 (5%)	33 (2%)	103 (5%)	54 (2.7%)	146 (7%)

Clinical diagnosis	no. (%)	no. (%)	no. (%)	no. (%)	no. (%)	no. (%)	no. (%)	no. (%)
Trichomoniasis	287 (43%)	280 (28%)	152 (37%)	145 (21%)	80 (31%)	66 (10%)	115 (38%)	71 (13%)
Candidiasis	38 (5.6%)	17 (1.7%)	24 (5.8%)	12 (1.7%)	17 (6.5%)	11 (1.7%)	30 (9.8%)	15 (2.6%)
Bacterial vaginosis	73 (10.8%)	65 (6.5%)	31 (7.5%)	59 (8.5%)	19 (7.3%)	42 (6.6%)	33 (10.8%)	65 (11.4%)
Cervicitis	70 (10.4%)	55 (5.5%)	34 (8.3%)	38 (5.5%)	17 (6.5%)	9 (1.4%)	21 (6.8%)	14 (2.4%)
PID	9 (1.3%)	9 (0.9%)	0	0	0	0	0	0





There was a fall in symptomatic prevalence in Arm A and B in the four rounds of intervention.

Discussion

This study was done to determine the current prevalence of reproductive tract infections in Drgapur, West Bengal region and then to evaluate the effectiveness of the community intervention. This was done by tracking gynaecological symptoms in the population during the period of intervention. A special group was randomly selected from this population and prevalence based on laboratory tests was determined. Comparing this to a similar study done in 1996 in the pre-intervention period would indicate the effect of the intervention.

Community based studies of this nature have often encountered the problem of women's negative response to a gynaecological examination. [14] As the Community Health Department of CMC has a fairly good rapport with the people in the community, there was a good response rate of 94%, enabling this study to be carried out. Young married women were the target population in this study because in a social context that emphasizes early childbearing, they are likely to experience pregnancy and birth outcomes that might be influenced by RTIs. Worldwide, the majority of new HIV infections occur among young people aged 15-24, hence there is a need to assess the prevalence of RTIs in this age group.

Demographic Features

The level of education was good and most young women entered high school (72.5%). Health messages focusing on adolescents in high schools are a good

strategy for prevention of RTIs. However the remaining girls who never attend high school should be specially targeted so that they are not neglected. Arm B had many more men in the armed forces (12%) than Arm A. Long periods of separation between couples encourages high risk behaviour.[15,16] Special efforts should be taken to educate this vulnerable group. The number of reported induced abortions was low. It is possible that this is not a true picture as women may not be willing to volunteer this information. Use of sanitary napkins was low and most women reused the cloth during menstrual cycles which placed them at a risk for reproductive tract infections. IUCDs which are reported to increase the risk for RTIs had a poor uptake in this population.[17]

Gynaecological Symptoms

The present study showed that 32% of the sample population had one or more gynaecological morbidity. There was a fall in symptomatic prevalence as compared to the study done in 1996 in the same area (58%). The most common symptom was vaginal discharge(28%). The monitoring data showed a slow decline in symptoms reported in both arms. Compared to the large number of women with gynaecological symptoms, very few women (3%) reported the presence of symptoms in their partners. This suggests poor communication among the couples in this area. Better discussion between them would promote improved health seeking.

Types and Prevalence of RTIS

The present study reveals a prevalence of 18% RTIs in this rural population. The prevalence is lower than the other studies conducted in developing countries. It is possible that this is an outcome of the community intervention. Comparison of prevalence of RTIs in different population based studies :* [14,18,19,20]

STUDY	Any RTI	Trichom oniasis	candidiasis	Bacterial Vaginosis	chlamydia	gonorrhea	syphilis
Haryana 1997	NA	9 %	na	48%	NA	0	NA
New Delhi 1996 – 2000	56%	4%	19%	41%	29%	0	4%
Peru 1997 – 98	70%	11.5%	4.5%	43.7%	6.8%	1.2%	2.9%
Gambia 1999	47%	6.2%	12.6%	37%	1.2%	0	3.2%
Goa 2001-2003	28%	1.2%	8.5%	17.8%	1.3%	1.9%	NA
Present study 2021-2023	18%	5%	2%	13%	2%	0	0.5%

- most current information is not available.

The most common RTI was bacterial vaginosis. The clinical signs may not be convincing and many women who seek medical care for this condition are reassured that nothing is wrong. Bacterial vaginosis can lead to an increased incidence of pre-term delivery,[21] chorioamnitis and post partum endometritis. Although culture grew candida in 136 women , invasive infection was present in just 7(2%). This is probably due to improved hygiene. The low prevalence of gonorrhea is comparable with other studies. Overuse of penicillins probably contributes to the low levels of syphilis and gonorrhea.

The women who reported the presence of symptoms, 82 (58%) did not have any RTIs. Other studies have reported similar findings among women in South India. It is postulated that genital secretions have deep ethnomedical significance.[6] It may be an expression of powerlessness , anxiety and disturbed family dynamics. Hence it is important that health-care workers are sensitive to these issues and do not dismiss these women as having no medical illness. The syndromic approach to the management of reproductive tract illnesses bases treatment on the presence of symptoms reported. Since more than half of the women who complained of symptoms had no significant infection, this approach would lead to substantial over-treatment of women with presumed RTIs. Overtreatment wastes resources and contributes to the spread of antibiotic resistance.[22,23] Hence there is a need to revise this approach to management.

Among the 291 patients who did not report symptoms, 19 (7%) had RTIs. In the previous study in 1996, 30% of asymptomatic women had RTIs. Hence there is a better awareness and willingness to report symptoms which will lead to better control. Of the 25 patients who had STIs , more than half (56%) did not report symptoms. STIs lead to serious chronic consequences , hence there is a need to develop screening tools that detect these organisms.

Factors Influencing RTI'S and STI'S

Higher educational status of respondents, arm B of intervention (female doctor) and tubectomy were found to be protective for RTIs. A study conducted in Goa in 2001 also reported the protective effect of repondent's education on RTIs. Women with better education are more aware and empowered to seek care for their illnesses. Women in Arm B had better outcome than those in Arm A. The more qualified physician is probably able to diagnose and treat more effectively.

There were no factors found to influence STIs. Some of the factors that could influence STIs like sexual practices could not be studied here due to cultural reasons. Women married to husbands working in the armed forces or in transport did not have significantly higher STIs.

Health Seeking Behaviour

Of the women who had symptoms, 70 (51%) sought treatment and 67(49%) did not. There was not much improvement since the earlier study in 1996 when 65% did not seek treatment. 41% of them did not sense the need to as they perceived their symptoms as minor and not requiring treatment. 16% did not have time which is probably due to household responsibilities which cannot be set aside so

as to seek care. Hence services should be provided to them at the community level for better accessibility. Women are often reluctant to discuss their gynecological symptoms and 16% of them did not seek care as they were shy. There is a need to develop more openness and better communication between couples regarding matters relating to reproductive health. 12% of women did not seek treatment for fear of confidentiality. The CHAD health aide was the most sought after person (27%) for health care. Since she has a good rapport with the women and is available at the community level, training the female community health workers to detect and treat RTIs at the community level would be acceptable to the women. Only 1 person approached an unqualified private practitioner in contrast to 61% in the previous study in 1996. This suggests that the health services offered are more acceptable to them.

Evaluating the Effect of Intervention

A) Monitoring symptomatic prevalence

Symptoms were monitored by the field workers during the period of intervention from 2001 to 2005. There is a declining trend in the number of symptoms reported in both arms. In Arm A the total symptomatics dropped from 31% to 15% and in Arm B from 48% to 28%. This fall was most marked with the symptom of vaginal discharge which dropped from 30% to 14% in Arm A and 42% to 27% in Arm B. Clinically diagnosed infections dropped for trichomoniasis from 43% to 38% in Arm A and 28% to 13% in Arm B, cervicitis and pelvic inflammatory disease. Hence the focused intervention over a period of four years resulted in a declining prevalence of symptoms as perceived by the women.

B) Comparison with the preintervention study in 1996
The following are the results of the two studies conducted in 1996 and 2006 :

	Pre intervention 1996			Post intervention 2006		
	A	B	Total	A	B	Total
N	210	241	451	228	204	432
STI	40 (19%)	26 (11%)	66 (15%)	18 (8%)	7 (3%)	25 (6%)
Endogenous	71 (34%)	53 (27%)	124 (28%)	39 (17%)	22 (11%)	61 (14%)
Any RTI	97 (46%)	76 (32%)	173 (38%)	51 (22%)	27 (13%)	78 (18%)
TV	36 (17%)	22 (9%)	58 (13%)	15 (7%)	6 (3%)	21 (5%)
BV	48 (23%)	34 (14%)	82 (18%)	35 (16%)	19 (9%)	54 (13%)
Candid	23 (11%)	22 (9%)	45 (10%)	4 (2%)	3 (2%)	7 (2%)
Syphilis	1 (0.5%)	0	1 (0.2%)	2 (0.9)	0	2 (0.5)
GC	0	0	0	0	0	0
Chla	3 (1.5%)	3 (1.3%)	6 (1.4%)	1	1	2 (2%)

There were 451 women examined in 1996 and 434 in 2006. Using test of proportion the significance of the fall in prevalence was calculated. There was a fall in total RTIs from 38% to 18% ($p<0.01$). The drop in prevalence of STIs from 15% to 6% ($p<0.01$) and endogenous infections from 28% to 18%($p<0.01$) was significant. Reduction in the proportion of trichomoniasis, bacterial vaginosis and

candidiasis was also significant. On analyzing the two arms separately, the fall in prevalence was significant in both arms for the following :

	ARM A			ARM B		
	P value	SE	95% CI	P value	SE	95% CI
RTI	< 0.02	4.4	15.2, 32.8	< 0.02	3.8	11.4, 26.6
STI	< 0.02	3.2	4.6, 17.4	< 0.02	2.3	3.4, 12.6
Trichomoniasis	< 0.03	3.1	3.8, 16.2	< 0.03	2.2	1.6, 10.4
Candidiasis	< 0.02	2.3	4.4, 13.6	< 0.02	2.1	2.8, 11.2

Hence both the health-aide arm and the doctor arm showed significant fall in infections. This study shows that using the health-aide to manage RTIs in the community is effective in reducing the prevalence of RTIs. Since she is more accessable and less expensive than the female doctor, considering the use of the health-aide to manage RTIs under constant monitoring and supervision is a useful strategy.

Limitations

1) As there were multiple interventions introduced, it was difficult to identify which intervention worked best.
2) Laboratory data was not available for 2001. Since data on symptomatic prevalence was available, it was used and it showed a declining prevalence.
3) Difference of effectiveness between arms could not be calculated as they belonged to different populations.

Conclusions and Recommendations

This study demonstrates the effectiveness of a comprehensive community based intervention programme in reducing the prevalence of reproductive tract infections. Two levels of healthcare providers were used, namely the health-aide and female doctor. It was found that there was a fall in the prevalence of RTIs and STIs in the post-intervention period. This fall was significant in both the health-aide and the doctor arm. Among the factors analyzed respondents's education was found to have a significant influence on RTIs. Symptomatic diagnosis was not very appropriate in diagnosing RTIs.

Female literacy programmes and school health education should be emphasized. Couple dialogue should be encouraged for improved health-seeking. Diagnosis should not rely solely on symptoms reported,a clinical examination with minimal laboratory tests like wet preparation should be done. A community based intervention is recommended to reduce the prevalence of RTIs. If there is a shortage of doctors available to manage RTIs, the use of a health-aide can be considered. An earlier study on the cost-effectiveness of this strategy established the health-aide arm as less expensive than the female doctor for every extra case of syndromic cure. The health-aide has good rapport with the women and is more accessible to the community. Using the health-aide in the management of RTIs under constant monitoring and support will be effective, feasible, less expensive and will increase the trained man-power available to provide health services.

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