Prevalence and Risk Factors of Symptoms of Pelvic Inflammatory Disease in a Rural Community of Jamshoro, Sindh, Pakistan

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Abstract

Objectives: (1). To estimate the prevalence of symptoms of pelvic inflammatory disease (PID) in rural Jamshoro, Sindh, (2). To assess specific social and biological risk factors of symptoms of PID
Methodology: Trained females conducted the interviews using a pre-tested Sindhi questionnaire during a cross-sectional survey carried out in 8 villages of rural Jamshoro, Sindh. Women reporting either lower abdominal pain or vaginal discharge with continuous or intermittent fever during the 6 months prior to interview, were classified as having PID symptoms.
Results: We approached 753 ever-married women and successfully interviewed 738 (98%) from July-September 1997. Sixty-five women (9%) had symptoms consistent with PID, and 156 (24%) reported ever using a modern contraceptive. Symptomatic women were 3.6 times more likely to have ever used IUCD/ tubal ligation (95% CI, 1.9 - 6.9), 1.8 times more likely to have married at earlier age (<15) (95% CI, 1.1 - 3), and 3 times more likely to be housewives by occupation (95% CI, 10 - 8.4) as compared to women who did not have PID symptoms.
Conclusion: Symptoms of PID among tubal ligation! IUCD users may reflect existence of unhygienic conditions during application of procedure, delay in replacement of IUCD and mismatching in the size of JUCD with uterus. The quality of life is affected in women with PID symptoms and may have serious consequences like infertility. These symptoms need thorough evaluation/ investigation to gauge the magnitude and nature of the problem and to guide intervention, effective promotion of women's socio-economic status, health education regarding counselling for delaying age at marriage and hygienic/ safe use of family planning methods €JPMA 49:188, 1999).

Introduction

Pelvic inflammatory disease (PID) is an important public health problem with serious repercussion on women's health and well being. Other than the chronicity of lower abdominal pain marring the women's well being, infertility and it's associated stigma compounds the need to study this issue in developing countries[1]. Though few studies suggest that 24 - 32 % women in India[2,3] and 8 % in Pakistan[4] suffer from PID, but we do not have adequate information on magnitude, distribution and determinants of PID and other gynecological morbidities in developing countries[5].

Global interest in improving women's health has mainly been confined to improving family planning and child survival interventions[6]. Though maternal and child health care was included among eight basic components of primary health care[7], little attention has been given to the reproductive health of non pregnant women. Interestingly, in developing countries such women are approached mainly for family planning programs[8], without attention on reproductive tract infections (RTls) common in these countries. Consequently majority of upper RTI (PID) leads to serious consequences of developing

infertility among unfortunate victims[9]. Women suffer from PID, and working to understand and there by preventing/reducing risk factors influencing PID and so be able to alleviate that suffering is necessary.

Numerous risk-factors have been identified to influence development of PID in India, Egypt, and elsewhere[2,10,11]. Among them age of women, age at marriage, number of children, and inter-birth interval are important biological characteristics which may be related with PID. RTIs, diseases of cervix and uterus (PID) and utero-vaginal prolapse (UVP) increases with age4. Age at marriage and age at birth of first child, birth order, family size and length of inter-birth interval have important effects on reproductive morbidity[12-14]. The risk of developing genital and pelvic infections increases with each birth[15]. Various socio-cultural and behavioural characteristics of women may also contribute in development of PID among them. Several studies conducted worldwide have indicated relationship of early age sex with RTIs and STDs[16-19]. RTIs are more likely to occur among commercial sex workers[20], women working in multinational companies in developing countries[21] and girl students in Zaire who accept a "sugar daddy' for continuation of their studies[22]. Poverty predispose women to infection and other ailments[20] and limited access to health services utilization increase their risk of RTIs[23].

Hygienic practices and RTIs are negatively associated with each other10. Bangladeshi women with poor hygiene were twice likely to develop RTl[24]. These women had used home made rags to absorb their menstrual blood which might contain various pathogens leading to RTI among them24. Use of intrauterine contraceptive device (IUCD) is associated with increased risk of Ril and P1D[25-28] among women. Indian women with RTIs were more likely to have been sterilized relative to those without having these infections[5]. The mechanism of action for these was existence of unhygienic conditions during the procedure leading to introduction of infection[5].

PID substantially affected health and quality of life of women and consequently of our nation. In such a situation, a community-based study was designed to estimate prevalence and risk-factors of symptoms of PID among ever-married women (Atleast once legally united with men for living together and procreating children) of rural Jamshoro, Sindh. The risk factors of symptoms of PID assessed were current age of women, age at menarche, age at marriage, parity, ever-use of family planning methods (FP). education, occupation, mobility, personal hygiene, and socioeconomic status (SES) of women.

Methodology

Pakistan is a South-Asian Muslim country, with 130 million population and average annual growth rate of 2.6 percent, Sindh is second largest among the four province of country with 30 million population, Dadu is one of the largest districts of Sindh with a population of 1.3 million[29].

Jamshoro (study site) is a hilly area of district Dadu, 150 kilometers (km) north-east of Karachi, divided into scattered villages (rural Jamshoro) and assemblage of prestigious educational and other institutions of Sindh (urban Jamshoro).

The estimated population of purposively selected 8 villages of study area was 20,000 including 3160 ever-married women. These villages vary in size and are near to Liaquat Medical College Hospital Jamshoro (LMCH). We interviewed required number of women proportional to the size of each village on random basis from the direction decided by rotating a glass bottle in the center of every village.

We used a questionnaire to elicit information on symptoms of PID (lower abdominal pain or vaginal discharge with continuous or intermittent fever in past 6 months) and risk factors of symptoms of PID. A manual of instruction was used to guide interviewers in the field for introducing themselves to the interviewee and to keep uniform approach during data collection. The questionnaire and manual of instruction were initially written in English then translated into Sindhi and back translated into English before using for pretesting and data collection of this project. The data was collected by trained female

interviewers under the supervision of a field supervisor and a capable principal investigator.

We calculated sample size separately for each of the two objectives. As prevalence of symptoms of PID in the community was unknown, we considered values of p which gives maximum variance (p = 0.5) leading to the largest sample size, with 95 % confidence interval (Cl) and 5 % margin of error, and using one proportion sample size formula we required 385 women. Considering 10 % refusals and 5 % incomplete cases we needed 443 ever married women to be interviewed for estimating the prevalence of symptoms of PID in the study area.

Literature regarding prevalence of various risk factors influencing symptoms of PID among women in Pakistan is almost absent. The search of international literature revealed from 24 % older women (>49 years) in India[2] to almost 60 % ever use of contraceptives among women in Egypt 10. Based on this information we assumed prevalence of risk factors in the study area range from 20 to 60%. In-order to detect crude odds ratio (OR) of atleast 2.5 for these risk factors at 5 % significance level and 80% power we need 94 women each for women with and without having symptoms of PID[30]. Almost 5% women reported symptoms of PID in India in 1993[5] and 19 % in Egypt in 1989-90[10]. Based on this information we assumed 10% prevalence of symptoms of PID, using 1:9 of women with and without having symptoms of PID for maintaining 80% power of the study we require 53 women with and 477 women without having symptoms of PID[31]. Giving l0% allowance for expected non-response and 5% for incomplete information, we needed 6 1 women with and 549 without having symptoms of PID. In total 610 women were required, but we interviewed 738 (128 more) ever-married women to assess role of intended risk-factors in influencing symptoms of PID among them in the study area.

After involving the community, field team interviewed 738 ever-married women from 8 villages during a cross-sectional survey from July-September 1997. After field editing, the data was brought to the Department of Community Health Sciences (CHS), Aga Khan University (AKU), Karachi and was twice entered by two different data entry operators, and final editing, consistency checking and checking for missing information was done.

Descriptive results of the prevalence and predictors of symptoms of PID was initially run, followed by univariate analysis of predictors of symptoms of PID. In case of the continuous independent variables, graphic display were obtained in-order to decide appropriate cutoff levels. Reference group for each independent variable was category with minimum level of risk for PID. OR and their exact 95 % Cl for maximum likelihood estimates of OR were calculated by using Epi info version 6.0.

Multiple logistic regression was used to control for confounding, to introduce interaction terms, to see simultaneous effect of multiple risk factors and to obtain adjusted odds ratio (AOR) and 95 % CI for each risk factor that influence symptoms of PID[30,32], by using SPSS.

Predictors with biological plausibility or showing significant association (p.value <0.25) with symptoms of PID on univariate analysis were selected for multivariate analysis. The correlation between the risk factors was assessed through Chi square test and their associated p.value <0.05, only those with high biological importance were taken as candidate variables for multivariate analysis.

We used Levins formula to calculate population attributable risk percent (PAR): $X=v(R-l)/ 1+v(R-l)$ Where X indicates the population attributable risk, n is the prevalence of risk factor in the population while R is the measure of risk associated with the risk factor of interest.

Results

We approached 753 and interviewed successfully 738 (98%) of ever-married women. Mean age of women was 37 years (±12.3), with mean age at marriage 17 years (±3.4). Mean parity in area was 4.6 (± 3), with literacy rate among women being (26%). Most of the women (84 %) in the area were housewives (Table 1).

Table 1. Prevalence of symptoms of specific gynecological morbidities, and Demographic characteristics of the study women. Sample Survey Jamshoro Sindh, Pakistan. July-September 1997.

Name of the morbidity	Number	Percentage
Pelvic inflammatory disease	65	8.8
Urinary tract infection	125	17
Uterovaginal prolapse	64	8.7
Lower reproductive tract infection	58	7.9
Infertility	65	8.8
Menstrual irregularities	111	15
Anemia	488	66
Dyspareunia	36	5.0
Characteristics		
Current age (years)	37.0+12.3	N.A[1]
Age at menarche (years)	13.4+1.1	N.A
Age at marriage (years)	17.0+3.4	N.A
Educational level[2]		
Illiterate	545	74.0
1-5	149	20.0
>5	44	6.0
Occupation		
House wife	617	83.6
Govt/private service	48	6.5
Others (shopkeeper/student)	73	9.9
Parity[3]		
Nulliparous	55	7.5
1-3	225	30.5
≥4	458	62.0
Distance of villages from LMCH		
Near	266	36.0
Away	472	64.0

1. N.A=Not applicable
2. Illiterate=No formal education & can't read/write, 1-5 and > 5=years of schooling
3. Number of live births per women

Information of possession of agriculture land and shops, animals and other household assets were used as proxy indicators of economy of the study sample. Results show that 12.2% owned an agriculture land, 6% possessed domestic animals and 51% were owning radio/tape recorder. There were 70% of

women who reported taking a bath daily though considerably fewer women (17%) bathed daily during menstruation (Table 2).

Table 2. Economic and personal hygienic characteristics: Sample Survey Jamshoro Sindh, Pakistan. July-September 1997.

Characteristics	Number	Percentage
Economy		
Construction of house[1]		
Pucca	575	77.9
Semipucca	124	16.8
Kutcha	39	05.3
Radio/cassette player		
Yes	376	51.0
No	362	49.0
Land		
Nil	648	87.8
< 15 acres	57	7.7
>15 acres	33	4.5
Domestic animals[2]		
Yes	44	6.0
No	694	94.0
Hygiene		
Bathing		
Daily	515	70.0
After 2 days	202	27.0
> 2 days	21	3.0
Bathing during menstruation		
Daily	124	16.8
After 2 days	139	19.0
> 2 days	390	52.8
NA (menopausal)	85	11.5
SES[3]		
High	185	25.0
Low	553	75.0
Personal hygiene[4]		
Good	410	56.0
Poor	328	44.0

1. Pucca=house made with kiln bricks & cement, Semi pucca=with kiln bricks & mud, Kucha= with unbaked bricks & mud.
2. Domestic animals: Possession of any of the following: cow/bufalow, ox/bull, sheeps/goats
3. Composite score of proxy indicators of economy (Rs:50000-636500). High=score ≥145700, Lower=score <145700.
4. Composite score of proxy indicators of women's personal hygiene (0-6). Good hygiene=score ≥4, Poor hygiene=score <4.

Among the 215 (29%) women who worked to earn money, 124 (58%) worked inside their houses.

Majority of them (8 1%) needed permission from their husbands or any other member of their family, to go out of their house in case of their own or their children's illness. Women in the reproductive age who had the knowledge of various methods and sources of FP-practice were (40%), but ever user of contraceptives among them were 24% only. Among ever users, 6.1% used IUCD and 5.1 % had tubal ligation (TL) (Table 3).

Table 3. Mobility characteristics of ever married women and practice of FP among reproductive age women. (Sample Survey Jamshoro, Pakistan. July-September 1997).

Characteristics	Number	Percentage
Mobility		
Work to earn money		
Yes	215	29.0
No	523	71.0
Work site[1]		
Inside house	124	16.8
Outside house	48	6.5
Both	43	5.8
NA (don't earn)	523	71.0
Mobility[2]		
Mobile	369	50.0
Immobile	369	50.0

	Need permission to go out of house		Going out alone	
	n	%	n	%
Own sickness				
Yes	600	81.0	197	26.6
No	137	19.0	541	73.4
Sickness of children				
Yes	601	81.4	199	27.0
No	138	18.6	539	73.0
Family planning practice	Ever User (n=653)		Current user (n=653)	
Having Knowledge of FP				
Yes	261	40.0	261	40.0
No	392	60.0	392	60.0
Used any method of FP				
Yes	156	24.0	118	18.1
No	497	76.0	535	81.9
Names of methods used				
IUCD	40	6.1	24	3.7
Oral pills	34	5.2	21	3.2
Tubal ligation	33	5.1	33	5.1
Male withdrawal	25	3.8	22	3.4
Others3	39	6.0	21	3.2

1. Women probed to express earning of money irrespective of quantity, in order to know their mobility, women earning inside house and both (inside/out side house) are basically house wives by profession
2. Composite score of proxy indicators of women's mobility (0-9). Mobile=score ≥2, Immobile=score <2.
3. Injection/Norplant/Condom/Cream/jelly/Taviz/Faki

There were 65 (9 %) of the interviewed women who reported symptoms consistent with PID (Table 1). Women with symptoms of PID were almost two times more likely to have married at earlier age (O.R=2.1, 95 % C.l=1.2-3.6), almost 3.8 times more likely to be ever users of IUD/tubal (O.R=3.8, 95% C.I=2.0-7.2) and almost pills/condoms/other (O.R=1.5, 95% C.I=0.7-3.2), and 3.2 times more

likely to be housewives (OR-3.2, 95% CI=1.110.7) as compared to those who did not have symptoms of PID (Table 4).

After adjusting the effect of various risk-factors, women having symptoms of PID were 3.6 times more likely to have ever used IUD/TL (O.R3.6, 95 % C.l=l.9-6.9), 1.8 times more likely to have married at earlier age (OR=1 .8, 95 % C.I=1.1-3.0) and 3 times more likely to be housewives as compared to women who did not have symptoms of PID (O.R=3.0, 95% Cll.0-8.4). The other risk-factors remained predictors of symptoms of PID, but could not retain their significance and were excluded from the main effects final model (Table 4).

Table 4. Analysis of Social and biological risk factors of symptoms of PID

OR and 95 % CI for risk factors of symptoms of PID

Risk factors	PID^{+}=65		PID^{-}=673		OR	95%CI
	n	%	n	%		
Age at menarche						
≤12	18	28	109	16	2.0	1.1-3.7
>12 (ref)	47	72	564	84		
Age at marriage						
≤15	35	54	242	36	2.1	1.2-3.6
>15 years (ref)	30	46	431	64		
Parity						
≥7	23	35.4	160	24	1.8	1.0-3.1
<7 (ref)	42	64.6	513	76		
Ever user of FP						
IUD/TL	17	26	60	09	3.8	2.0-7.2
Other methods[1]	09	14	82	12	1.5	0.7-3.2
Nil (ref)	39	60	531	79		
Occupation of women						
House wife	61	94	556	82.6	3.2	1.1-10.7
Others (ref)	04	06	117	17.4		
Mobility[2]						
Immobile	41	63	328	49	1.8	1.0-3.2
Mobile (ref)	24	37	345	51		

AOR, & 95 % CI for risk factors of symptoms of PID

Risk factors	Estimated Coefficient	Estimated AOR	95 % CI
Ever use FP			
IUD/TL	1.29	3.6	1.9-6.9
Other methods	0.37	1.4	0.7-3.0
Nil (ref)			
Age at marriage			
≤15	0.6	1.8	1.1-3.0
>15 (ref)			
Occupation			
House wife	1.1	3.0	1.0-8.4
Others (ref)			
Constant	-3.8		

1. Oral pills/condoms/cream/jelly/injections/norplant/male withdrawal/Taviz/Faki.

2. Composite score of proxy indicators of women's mobility. Mobile=score ≥2, Immobile=score <2.

- - 2 log likelihood value of saturated model = 440
- - 2 log likelihood value of current model = 413
- Chi square = 27   df = 4   p-value = 0.000

The likelihood ratio test illustrates that the over all effect of the variables in the final main effects model relative to saturated model is significant.

We assessed interaction, which revealed no interaction between the variables of final main effects

models.

The PAR of IUCD/TL use and early age at marriage was 22% and 12% respectively by using estimated prevalence and OR of these risk-factors under Levin's formula.

Discussion

This community-based investigation of PID is one of the first such studies ever conducted in rural Pakistan, the only other one to our knowledge was WHO multicountiy collaborative study conducted in 1981[4].

Nearly nine percent of women reported symptoms consistent with PID from the study area. This finding was almost similar to those reported from an earlier Pakistani study (8%)[4], but is higher than findings of another interview-based Indian study (5.2%). Nevertheless this estimated prevalence of PID was certainly lower than the results shown by other medical examination-based studies in India (24.2%)5 and Egypt (1 9.4%)[10].

Low reporting of symptoms of PID in present study may be due to it's interview based nature which can miss early/asymptomatic cases, likely to be identified by clinical and pathological test. PID is a disabling disease and can pose serious threat to social and health status of women by causing infertility among women, if not treated appropriately and timely.

Women with symptoms of PID were more likely to be housewives as compared to those women who did not report such symptoms of PID. Significant independent effect of housewife as risk factor of symptoms of PID have not been documented in the international literature, though other occupations such as commercial sex worker, workers of companies without having adequate preventive measures in developing countries, and poor girl students in Zaire have been shown to be significantly associated with PID[20-22].

Women with symptoms of PID are more likely to have married at earlier age (<1 5) as compared to those women who did not have symptoms of PID. Significant independent effect of early age at marriage as risk factor of symptoms of PID could not be found in the international literature, though age at marriage, age at birth of first child, birth order, family size and length of inter birth interval are associated with reproductive and maternal morbidity, and mortality[12-14]. Similarly early, pre or extramarital sex have been shown to significantly influence development of PID and STDs[16-19]. Role of earlier marriage can indirectly be understood from these studies, because marriage is an indication of active sexual life in eastern societies, though extra marital sex cannot be excluded, but certainly it is minimal if compared to occidental societies. The mechanism of action in earlier marriage is existence of thin and fragile vaginal epithelium, which is injured during sexual intercourse, leading to PID-18

Women with symptoms of PID were more likely to be ever user of family planning as compared to those women who did not have symptoms of PID. In the present study, use of IUCD/TL was a significant predictor of symptoms of PLD. Significant independent effect of IUCD and development of PID have been shown in the international literature[25-28]. Similarly female sterilization has been shown to be a significant predictor of PID in India[2,5].

Use of contaminated IUCD; alteration of cervicovaginal milieu and compromise of host defense against pathogens, predispose to vaginitis and cervicitis. Ascent of infections through thread of the IUCD to the uterus can lead to subsequent development of PID[10,27]. Besides unhygienic conditions and use of contaminated instruments during tubal ligation also a cause of PID[2,33].

Twelve percent and 22% PAR for earlier marriages and IUCD\\TL use, is helpful for policy makers to emphasize on health education. Counselling for delayed marriages and encouraging hygienic/safe use of IUCD/TL will reduce the PID burden in the study area.

The present study, being a cross-sectional survey, could acquire present and past information on the

variables of interest. In such a case we can establish their possible relationship but not causality, due, to uncertainty of temporal relationship among them. Recall bias and non-differential misclassification of variables of interest may also be one of the major limitations in this kind of study. There is inability to obtain information on asymptomatic cases of PID and at the same time we can not validate reported information of symptoms and risk factors of PID by any clinical, or pathological means. As a result, under/over reporting of same can happen, but keeping in view

"culture of silence" under reporting is more likely to occur[2].

Despite the "culture of silence" and social stigma attached with PID, we found relatively high percentage (9 %) of women with symptoms of PID. The ever use of IUCDiTL, early age at marriage and being a housewife were significant risk factors for PID in the study area.

The findings of this study are sufficient voice for effective investment in reproductive health needs of poor women of the study and similar other areas of the country in broader context by strengthening of family planning program with health education of women for delayed age at marriage, and improved quality of care for hygienic and safe use of family planning methods. Reproductive Health Services should be incorporated in the Maternal Health Services currently being provided by the Government of Pakistan. Effective promotion of women's socioeconomic status to overcome the risk effect of being a housewife.

Acknowledgment

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