

CERVICAL CYTOLOGICAL EVALUATION ASSOCIATED WITH INFERTILITY IN RURAL WOMEN OF LUCKNOW, INDIA

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ABSTRACT

The camps have been organized for rural cervical cancer screening in the villages of Lucknow which offer valuable platform for the detection of infertility in young women and their cytological examination. The cervical cytology has been studied in the cases of infertility to find out if there is any increase in abnormal cytology and compare them with those obtained in fertile women (controls). Since its inception in May 2013, the camps organized were 186 in number and 5682 women attended these camps. Primary infertility was found in 182 and the secondary infertility in 31 women. The incidence of Squamous intraepithelial lesions of cervix (SIL) was found to be 14.8% in women suffering from primary infertility and 16.1% in the secondary infertility cases and was comparable with SIL rate of 17.4% in the controls. Persistent vaginal infections caused by the poor personal genital hygiene practiced by the rural women may be the reason for a high SIL rate in the fertile women. The SIL rate was seen high in the younger women upto 30 years with pain in lower abdomen and erosion cervix in the primary infertility cases while the high SIL rate was seen in 21-30 years age groups with parity 2 in secondary infertility cases with no SIL seen with symptoms and clinical lesions. Mostly young women upto 30 years of age complained of infertility and showed high SIL rate. These women were referred to the Hospital of Era Medical College, Lucknow for further investigation and treatment.

KEYWORDS: Infertility, SIL rate, Pain in lower abdomen, Young age, Cervical Cancer.

INTRODUCTION

In the rural India, the marriages of girls are performed at very young age. Hence they are exposed to earlier sexual exposure and prolonged sexual activity and 43.4% of the total 2949 women cytologically examined were in young age group between 16-20 years (117 cases) and young adults between 21-30 years (1163). The camps where these women were examined, offer valuable platform for women to convey their gynecological complaints to the attending gynecologist and subsequent treatment at the rural level. Since the young rural girls are very conscious of having child after marriage, any delay in the pregnancy may cause anxiety. Since these women are mostly financially weak, they cannot afford to consult a gynecologist in the city. These camps provide them opportunity to address their grievances and adequate management of any infertility problem. Some of them are infertile primarily because of some gynecological problems and are advised to visit Gynecology Department of ELMCH to consult senior gynecologist to know the cause of infertility and its subsequent treatment. Some of them become infertile after having a child or so

(secondary infertility) and they are also advised to visit Gynecology Department of the college for identifying the reason of not conceiving and treatment thereafter. The 182 women were found nulliparous and suffering from primary infertility and 52 of them were in the young age group of 16-20 years. Similarly out of 31 women suffering from secondary infertility, 25 women were from the age group of 21-30 years.

Since we had a sizeable number of women suffering from infertility who have undergone cervical cytological examination, the cytological findings obtained in these infertile women were with those in the fertile cases (2736 women). In view of reports of many investigators of increased cervical cytology abnormalities in the infertile women as compared to the control cases, Jaroudi, A.D., Gaffar B A, Hamont D V, Lundqvist M (1-4).

Materials and Methods

Rural cervical cancer screening is in progress since May 2013 in different rural blocks of western Lucknow under the auspices of Era's Lucknow Medical College and Hospital and till date, a total of

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186 camps have been organized and 2949 from 5682 women attending these camps have been cytologically examined. Out of 2949 women, 182 had complained of infertility and their cytological findings have been compared with those obtained in fertile women. The inclusion criteria for the study were young menstruating women, while pregnant women and those who have undergone hysterectomy have been excluded from the study. At the camps, cervical smears were taken from the squamocolumnar junction of cervix by the attending gynecologist. The cervical smears were immediately fixed in the absolute alcohol and were stained at the Cytology lab of the Department of Pathology of the college according to the Papanicolaou's technique. The cytological changes observed in the cervical smears were graded according to the revised Bethesda system of classification of 2014 Nayar, R (5).

The informed consent was obtained from the women undergoing cervical cytological examination on the pap smear form in the form of thumb impression if the patient was illiterate and signature if literate. All the cytological data was statistically analyzed according to the Chi-square test using software SPSS version 22.

Ethical clearance was also obtained from the Ethical Committee of the Institute before starting the screening program.

RESULTS

All the 213 infertile women encountered during study were divided in two groups –

- 182 suffering from primary infertility and.
- 31 from the secondary infertility.

PRIMARY INFERTILITY

The cervical cytology status of 182 women suffering from primary infertility was found to be as follows –

Normal-79(43.4%)

Inflammation - 68 (37.3%)

Sexually Transmitted Diseases (STDs) -

- Candida albicans-8 cases
- Koilocytosis-(Human Papillomavirus-HPV)-1 case

Atypical squamous changes of unknown significance (ASCUS) – 8 (4.3%)

Squamous intraepithelial lesions of cervix (SIL) – 27 (14.8%), all low grade SIL (LSIL)

The SIL incidence in 2736 fertile women of the study was found to be 17.4% (466 cases). However, the difference in the SIL rate between infertile (14.8%) and fertile women (17.4%) was found to be statistically highly significant. The high SIL incidence in the rural fertile women may be due to the fact that majority of

them (1706) were illiterate and were not aware of personal genital hygiene. Consequently, the vaginal infections caused by the poor genital hygiene remain persisted due to being not detected and treated because of lack of medical amenities at the rural level. This point gains support from our earlier findings in the urban women who were comparatively more educated and well informed and were cytologically evaluated at Queen Mary's Hospital, Lucknow between 1971 to 2005 and showed the low SIL incidence (7.2%) and which was 3.7% in the nulliparous women. This figure of 3.7% is very low as compared to 14.8% seen in the same category of rural women Misra, J, S (6).

The SIL rate in the infertile women as well as controls (fertile cases) had also been analyzed in relation to the different predisposing factors of cervical cancer. As regards the age (Table-1), the SIL rate in the young girls between 16-20 years was found to be maximum (15.3%) among all age groups but was same (15.3%) in the corresponding group of fertile women. Hence the difference in the SIL rate between the two groups was found to be statistically insignificant ($\chi^2 = 0.0$; $p = 1.000$). The SIL rate in the 21-30 years age groups in the infertile women was found to be 15.1% against 17.9% in the fertile women and the difference was statistically insignificant ($\chi^2 = 0.549$; $p = 0.459$). The SIL rate in the middle age women of 31-40 years was found to be 11.7% in the infertile women as against 17.7% in the fertile women but the difference was found to be statistically insignificant ($\chi^2 = 0.408$; $p = 0.523$). The SIL rate was 14.2% in the infertile women beyond 40 years and this figure was 14.8% in the fertile groups. Hence the difference in the SIL rate here also was statistically insignificant ($\chi^2 = 0.00$; $p = 0.969$).

Age group	No. of cases		SIL rate (infertile women)		Controls (fertile women)
	Primary infertility	Secondary infertility	Primary infertility	Secondary infertility	
16-20 yrs	52	1	8 (15.3%)	-	10/65 (15.3%)
21-30 yrs	106	25	16 (15.1%)	5 (20%)	190/1057 (17.9%)
31-40 yrs	17	4	2 (11.7%)	-	169/954 (17.7%)
Above 40 yrs	7	1	1 (14.2%)	-	102/689 (14.8%)

Table 1: SIL Rate in Infertile (both Primary and Secondary) and Fertile Women (Control Cases) in Relation to Age

When the SIL rate was compared with different gynecological symptoms in infertile women with controls, some interesting observations were found (Table-2). In women complaining of the vaginal discharge, the SIL rate was found to be high in the control group of fertile women (18.4%) than 10.5% seen with primary infertility but the difference was statistically insignificant ($\chi^2 = 2.28$; $p = 0.131$). Similar difference was also seen with menstrual disorders especially irregular menses (7.4% as against 14.9% in controls) but the difference was statistically insignificant ($\chi^2 = 1.14$; $p = 0.286$). Similarly no difference in the SIL rate was seen in the two groups in women complaining of pain in lower abdomen and those who were asymptomatic ($\chi^2 = 0.022$; $p = 0.881$ and $\chi^2 = 0.00$; $p = 984$ respectively).

Gynecological symptoms	No. of cases	SIL rate (Primary Fertility)	Controls (fertile women)
Vaginal discharge	57	6 (10.5%)	198/1075 (18.4%)
Pain in lower abdomen	28	5 (17.8%)	122/727 (16.7%)
Menstrual disorders (Irregular menses)	27	2 (7.4%)	44/295 (14.9%)
Asymptomatic	85	14 (16.4%)	136/830 (16.3%)

Table 2: SIL Rate in Infertile (Primary Fertile) and Fertile Women in Relation to Gynecological Symptoms

As regards clinical lesions of cervix, only 5 cases of erosion cervix were seen in infertile women (Table-3) and SIL was seen in one of them (20%). The SIL incidence in the corresponding category of controls was 20.7% and hence statistically there was no significant difference ($\chi^2 = 0.00$; $p = 965$). In women with normal cervix, similar status was seen ($\chi^2 = 0.018$; $p = 892$).

Clinical lesions	No. of cases	SIL rate (Primary Fertility)	Controls (fertile women)
Erosion cervix	5	1 (20%)	46/221 (20.7%)
Normal cervix	177	30 (16.9%)	453/2736 (16.5%)

Table 3: SIL Rate in Infertile (Primary Fertile) and Fertile Women in Relation to Clinical Lesions of Cervix

SECONDARY INFERTILITY

The cytological status of cervical smears of 31 women suffering from secondary infertility was found to be as follows-

Normal	-	9(29.1%)
Inflammation	-	13(41.4%)

STDs

a) Candida albicans	-	2 cases
b) Trichomonas vaginalis	-	1 case

ASCUS	-	4(12.9%)
SIL	-	5(16.1%)

(All LSIL)

As seen in the case of primary infertility, the SIL incidence did not show any statistical difference from 17.4% seen in the control women of the study ($\chi^2 = 0.018$; $p = 0.894$). However, the ASCUS rate was higher with secondary infertility (12.9%) as compared to 8.3% seen in the controls.

As regards age (Table-1), all the 5 SIL cases in the infertile group were seen in the young adults between 21-30 years (20%), which was slightly higher than 17.9% seen in the same age group of controls but was statistically insignificant ($\chi^2 = 0.087$; $p = 0.768$). Paritywise (Table-4), the SIL rate was 14.2% in para1 as compared to 16.4% in controls and the difference was statistically insignificant ($\chi^2 = 0.086$; $p = 0.769$). In para2, the SIL rate was very high (33.3%) with secondary infertility but was found statistically insignificant than 14.8% seen in the corresponding parity group of controls ($\chi^2 = 0.796$; $p = 0.372$).

Parity	No. of cases	SIL rate (Primary Fertility)	Controls (fertile women)
Para 1	28	4 (14.2%)	38/231 (16.4%)
Para 2	3	1 (33.3%)	71/477 (14.8%)
Para 3 and above	-	-	-

Table 4: SIL Rate in Infertile (Secondary infertility) and Fertile Women in Relation to Parity

No case of SIL was seen with either gynecological symptoms (vaginal discharge- 11 cases, pain in lower abdomen- 5 cases and irregular menses-6 cases) or clinical lesions of cervix (1 case each of erosion cervix and cervicitis) in 31 women suffering from secondary

infertility and the SIL rate was almost identical in asymptomatic women and those with normal cervix in the secondary infertility cases as compared to corresponding groups in the controls ($\chi^2=1.32$; $p=0.250$ in case of gynecological symptoms and $\chi^2=0.009$; $p=0.921$ in case of cervical lesions).

DISCUSSION

In the present investigation, SIL was seen in 14.8% of 182 women suffering from primary infertility and 16.1% of 31 women who complained the problem of secondary infertility. It was heartening to know that the SIL observed in these two categories of women were of low grade (LSIL) and no high grade SIL (HSIL) was seen. As emphasized earlier, this study was performed in rural women during cervical cancer screening program and the fertile women were taken as controls for comparing the SIL rate with those obtained in the infertile women. The SIL incidence in the fertile women (17.1%) was comparable with those obtained in the infertile women and a high SIL rate in the rural women may be attributed to the persistent vaginal infections caused by the poor personal genital hygiene seen in the illiterate women.

A high incidence of abnormal cervical cytology was also reported in the infertile women by Jaroudi, D (1), Abdull Gaffar, B (2), Hamont, D, (3) Lundqvist, M, (4) On the other hand, Pairweti, S (7) have not found any difference in the SIL rate between infertile and fertile women.

In the rural women, primary infertility can be attributed to vague pain in lower abdomen or any hormonal manipulation as a result of estrogen therapy taken by the patients for the treatment of infertility. Since we do not have any follow up of these patients, we cannot exactly tell the reason for a high SIL rate. Further few women suffering from pain in lower abdomen have to be investigated for any occurrence of pelvic inflammatory diseases (PID). Unfortunately, we do not have access to these women as to whether any of them have undergone further investigation at the Era Hospital. Only we can state that 28 cases of infertile women with primary infertility had shown pain in lower abdomen and 5 of them had SIL (17.8%). However, we have not done Chlamydia trachomatis diagnosis in screened cases. The detailed investigation of these 28 cases showing pain in lower abdomen showed 14 of them being young adults between 21-30 years. However, no STDs was seen in these 28 cases and illiteracy was observed in 60.7% of cases. In the cases of secondary infertility, though the number of cases were small (31) but worthy to mention was high SIL rate of 33.3% seen in the para 2 cases which may be due to hormonal treatment taken by the patient.

Since the number of women showing pain in lower abdomen were too small in this groups (5), and none of them showed SIL, no further investigation was not taken.

Abdull Gaffar, B (2), have suggested that the high SIL rate in the infertile women may not be the related to infertility per se, but rather its etiology is multifactorial and could be attributed to the causative agents like PID associated with Chlamydia and hormonal stimulation (2). Though we have not done HPV-DNA testing in our series due to lack of funds, but these authors have suggested that risk of HPV infection is caused by Chlamydia and other co-factors like early sexual exposure and promiscuity Silins I (8) Samoff E(9), Friedek D (10), Negrini BP (11).

The HPV infection in the presence of these co-factors and hormone use may be the reason for high abnormal cytology seen in the present series of infertile women.

CONCLUSIONS

A high occurrence of infertility in rural women with high incidence of abnormal cytology is alarming and these women most of them being young girls should be investigated for PID or hormone intake. The camps organized for rural cervical cancer screening offers valuable platform for detection of infertility in the young rural women and their further investigation and treatment.

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CONFLICT OF INTEREST: None

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