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# Study of Leucorrhoea in Reproductive Age Group in Patients Attending OPDs in Saraswathi Institute of Medical Sciences, Hapur, Uttar Pradesh

**Swati[1], Sarandeep Singh Puri[2], Seema Goel[3], Parul Singhal[4]**

[1]3rd Year, Post Graduate Student, Pathology, Saraswathi Institute of Medical Sciences, Hapur, Uttar Pradesh, India; [2]Associate Professor, Pathology, Saraswathi Institute of Medical Sciences, Hapur, Uttar Pradesh, India; [3]Professor & HOD, Pathology, Saraswathi Institute of Medical Sciences, Hapur, Uttar Pradesh, India; [4]Professor, Pathology, Saraswathi Institute of Medical Sciences, Hapur, Uttar Pradesh, India.

## ABSTRACT

**Background:** 'Leucorrhoea', a fairly common gynaecological issue, is an abnormal vaginal discharge often associated with irritation and is non-hemorrhagic.

The objectives to investigate the various causes of leucorrhea among reproductive-age women. METHODS: The present study was conducted on 250 patients of adult female patients of the reproductive age group (aged 18 years to 45 years), clinically presenting with complaints of leucorrhoea during the period from October 2018 to December 2019 in the OPD Saraswathi Institute of Medical Sciences in Hapur, Uttar Pradesh. The PAP smear findings to establish the profile of the causative organism, presence of microorganisms done by wet mount, Gram staining and KOH mount and identify the bacterial and fungal pathogens of the indicated cases by culture identification.

**Results:** Age-wise distribution showed most common in the age group of 26-30 years, type of discharge thin mucoid in (72.8%), followed by thick curdy discharge in (16.8%).On PAP smear subjects were Negative for intraepithelial lesion or malignancy (NILM) (88%), a minor proportion of subjects (0.8%) had a high-grade squamous intraepithelial lesion (HSIL), Atypical squamous cells-cannot exclude HSIL (ASC-H) (0.8%), and squamous cell carcinoma (0.8%). The majority of females (34%) were seen to have S. aureus as observed on the bacterial culture of leucorrhoea secretions and fungal culture majority of females (27.2%) were seen to have the presence of C. Albicans.

**Conclusion:** A significant association of leucorrhoea with socio-demographic factors, clinical features, PAP smear, bacterial as well as fungal culture in the present study emphasizes the need for health education and preventive practices related to personal & menstrual hygiene & family planning practices in females.

**Key Words:** Leucorrhoea, Menstrual hygiene, Reproductive age

## INTRODUCTION

'Leucorrhoea', a fairly common gynaecological issue, is an irregular vaginal secretion frequently connected with irritation and is non-hemorrhagic. White, yellow or greenish discharges might be an indication of underlying pelvic pathology. It relates to more than an estimated 1/4th of patients' visits to the gynaecologist.[1]

This may be physiological or pathological. An augment to the normal vaginal discharge develops physiologically at puberty, during pregnancy, at ovulation, sexual arousal and the premenstrual phase of the menstrual cycle. Pathological secretions may be communicable or non-infectious. Infectious secretions may be due to explicit contagion such as Gonorrhoea, Trichomoniasis, Chlamydiasis, which are sexually passed on, and commotions in the normal vaginal flora cause Moniliasis and Bacterial vaginosis.

It is measured that transformation in the vaginal epithelium; changes in the usual bacterial flora and pH of the vaginal discharge dispose to leucorrhoea. But when it turns into a pathological situation it creates connected troubles like low backache, itching and burning sensation of the vulva, poor appetite, uneasiness, common weakness, pain in both legs etc.

As there are very few similar studies in this region, and none in the Hapur area of Uttar Pradesh, this study was undertaken to investigate the various causes of leucorrhea among

**Corresponding Author:**
**Dr. Sarandeep Singh Puri,** Associate Professor, Department of Pathology, Saraswathi Institute of Medical Sciences, Hapur, Uttar Pradesh, India.
R-12/72, Raj Nagar, Ghaziabad, Uttar Pradesh, Pin-201001; Contact: 9560970192; Email: drsarandeep147@gmail.com

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reproductive-age women attending OPD of a tertiary hospital (Saraswathi Institute of Medical Sciences) in Hapur, Uttar Pradesh

The study aims to investigate the causes of Leucorrhea in reproductive age group women among patients visiting the OPD of a tertiary care hospital (Saraswathi Institute of Medical Sciences) in Hapur, Uttar Pradesh. The objectives of the study are:

1. To study the PAP smear findings in the patients presenting with leucorrhoea to establish the profile of the causative organism such as bacterial, fungal, trichomonal or neoplastic.
2. To study the presence of various micro-organisms in patients resenting with leucorrhoea, identification done by wet mount, Gram staining and KOH mount.
3. To isolate and identify the bacterial and fungal pathogens of the indicated cases by culture identification.

## MATERIAL AND METHODS

### Study Design

The present study is an Observational, Cross-sectional, and the inferential study conducted in Saraswathi Institute of Medical Sciences, Hapur (Uttar Pradesh).

### Study Area:

The study was conducted among OPD patients of SIMS Hapur (UP), India.

### Study Period:

The study was conducted from October 2018 to December 2019.

## SELECTION OF CASES

### Inclusion Criteria:

1. Adult female patients of the reproductive age group (aged 18 years to 45 years).

### Exclusion Criteria:

1. All patients below 18 years and above 45 years.

### Clinical History and Examination regarding Leucorrhoea:

1. Gynaecological history of the patient, including parity, age at first childbirth, mass per-vaginum, history of any STD.
2. Amount, duration, colour and odour of discharge.

Visualization of Cervix: to rule out erosion, hypertrophy, suspicious growth

1. Wet Smear preparation: After a thorough vaginal examination a sample of the discharge was taken. A wet smear was prepared. For wet smear preparation, a drop of normal saline is put on a slide and mix a drop of the vaginal discharge. Placed a cover slip on the drop.
2. Then the smear was examined immediately first under low power, and later under high power for various micro-organisms like T.vaginalis (motile and flagellated), Candida (budding yeasts) along polymorphonuclear leukocytes, bacteria may be identified in wet film preparations. For further identification of various organisms, tests like the Germ Tube test were put along with various biochemicals and cultures were incubated and confirmed in the Department of Microbiology.
3. Simultaneously, the discharge was spread over another few slides for PAP staining (Papanicolau stain). Smears were immediately fixed in absolute alcohol and stained according to the PAP staining method. The cytopathological changes observed in the cervical squamous were graded according to the Bethesda system for reporting cervical cytology
4. C/S: The PAP smear showing various neutrophils or pus cells were segregated. Discharge of the cases was processed for culture/sensitivity.

### Statistical Analysis:

Statistical analysis was performed using SPSS (Statistical Package for the Social Sciences) for Windows (version 24.0).

## RESULTS

The age-wise distribution of the study participants (all females) showed that the majority of them was in the age group of 26-30 years shown in **Table 1,2,3**.

**Table 1: Age-wise distribution of study participants (n = 250)**

| | N | Minimum | Maximum | Mean | SD |
|---|---|---|---|---|---|
| Age | 250 | 18 | 45 | 30.10 | 6.209 |

**Table 2: Age-wise categorical distribution of study participants (n = 250)**

| Age categories | Frequency | Per cent |
|---|---|---|
| 18-25 yr | 68 | 27.2 |
| 26-30 yr | 92 | 36.8 |
| 31-35 yr | 26 | 10.4 |
| 36-40 yr | 53 | 21.2 |
| 41-45 yr | 11 | 4.4 |
| Total | 250 | 100.0 |

**Table 3: Marital status and Chief Complaint of the study participants (n = 250)**

| | | Frequency | Percent |
|---|---|---|---|
| **Marital Status** | Married | 250 | 100.0 |
| **Chief Complaint** | White Discharge | 250 | 100.0 |

- The type of discharge, majority of women have a thin mucoid type discharge from the vagina (72.8%), followed by less commonly reported thick curdy discharge (16.8%).
- The majority of women had a 'moderate' amount of discharge (61.6%), followed by a less commonly 'minimal' amount of discharge (23.2%).
- Colour of discharge, majority of women reported a greyish colour (52.8%), followed by less commonly white coloured discharge (39.2%).
- More than three-fourth (76.4%) of women reported having a smell in discharge, while the rest 23.6% did not report any smell in their vaginal discharge (Table 4,5,6).

**Table 4: Vaginal discharge history (n = 250)**

| Vaginal Discharge | | Frequency | Percent |
|---|---|---|---|
| Type of Discharge | Frothy | 26 | 10.4 |
| | Thick Curdy | 42 | 16.8 |
| | Thin Mucoid | 182 | 72.8 |
| | Total | 250 | 100.0 |
| Amount of Discharge | Copious | 38 | 15.2 |
| | Minimal | 58 | 23.2 |
| | Moderate | 154 | 61.6 |
| | Total | 250 | 100.0 |
| Color of Discharge | Greenish Yellow | 20 | 8.0 |
| | Grey | 132 | 52.8 |
| | White | 98 | 39.2 |
| | Total | 250 | 100.0 |
| Smell of Discharge | Absent | 191 | 76.4 |
| | Present | 59 | 23.6 |
| | Total | 250 | 100.0 |

**Table 5: Duration of Leucorrhoea (n = 250):**

| N | Minimum | Maximum | Mean | SD |
|---|---|---|---|---|
| 250 | 1.0 | 6.0 | 2.894 | 1.3216 |

**Table 6: Categorical duration distribution of Leucorrhoea (n = 250):**

| Duration of leucorrhoea | Frequency | Percent |
|---|---|---|
| 1 – 2 months | 84 | 33.6 |
| 2 - 4 months | 137 | 54.8 |
| 4 – 6 months | 29 | 11.6 |
| Total | 250 | 100.0 |

- Duration of leucorrhea, majority of women have been experiencing it since 2-4 months(54.8%), a less common reporting was of 1-2 months (33.6%) Table 6.
- Pruritis was 'absent in most of the females (64.8%) and was 'present' only in 35.2% of females.
- Dysuria was 'absent in 70% of the females and was 'present' only in 30%
- Dyspareunia, where it was 'absent in 80% of the females and was 'present' only in 20%.
- The majority of females (88.8%) reported having no relationship of leucorrhoea occurrence with oral contraceptives (OCPs), while 11.2% said that there is a possible association between taking OCPs and occurrence of leucorrhoea.
- More than half of the females were reported to have the relationship of leucorrhoea with intra-uterine devices (IUDs) (51.2%), while 48.8% of females did not have the relationship of leucorrhoea with IUDs
- Only 25.2% of females face the problem of leucorrhoea who had undergone tubectomy procedures, whereas 74.8% did not have any such problem with tubectomy procedures. (Table 7)

**Table 7: Clinical features associated with leucorrhea (n = 250)**

| Clinical features associated with leucorrhoea | | Frequency | Per cent |
|---|---|---|---|
| Pruritis | Absent | 162 | 64.8 |
| | Present | 88 | 35.2 |
| | Total | 250 | 100.0 |
| Dysuria | Absent | 175 | 70.0 |
| | Present | 75 | 30.0 |
| | Total | 250 | 100.0 |
| Dyspareunia | Absent | 200 | 80.0 |
| | Present | 50 | 20.0 |
| | Total | 250 | 100.0 |
| Relationship with OCPs | Absent | 222 | 88.8 |
| | Present | 28 | 11.2 |
| | Total | 250 | 100.0 |
| IUD | Absent | 122 | 48.8 |
| | Present | 128 | 51.2 |
| | Total | 250 | 100.0 |
| Tubectomy | Absent | 187 | 74.8 |
| | Present | 63 | 25.2 |
| | Total | 250 | 100.0 |

**Table 8: Outcome of PAP smear among study participants (n = 250):**

| PAP Smear outcome | Frequency | Percent |
|---|---|---|
| HSIL | 2 | .8 |
| ASC-H | 2 | .8 |
| ASCUS | 17 | 6.8 |

**Table 8: *(Continued)***

| PAP Smear outcome | Frequency | Percent |
|---|---|---|
| LSIL | 7 | 2.8 |
| NILM | 220 | 88.0 |
| SCC | 2 | .8 |
| Total | 250 | 100.0 |

- A majority of subjects were Negative for intraepithelial lesion or malignancy (NILM) (88%), followed by 6.8% subjects having atypical squamous cells of undetermined significance (ASCUS), and low-grade squamous intraepithelial lesion (LSIL) (2.8% subjects). A minor proportion of subjects (0.8%) had a high-grade squamous intraepithelial lesion (HSIL), Atypical squamous cells-cannot exclude HSIL (ASC-H) (0.8%), and squamous cell carcinoma (0.8%) ( Table 8).

**Table 9: Comparison of PAP smear outcome with Type of Discharge (n = 250):**

| Type of Discharge | | HSIL | ASC-H | ASCUS | LSIL | NILM | SCC | Total |
|---|---|---|---|---|---|---|---|---|
| Frothy | N | 0 | 0 | 0 | 0 | 26 | 0 | 26 |
| | % | 0.0% | 0.0% | 0.0% | 0.0% | 11.8% | 0.0% | 10.4% |
| Thick Curdy | N | 0 | 0 | 0 | 0 | 42 | 0 | 42 |
| | % | 0.0% | 0.0% | 0.0% | 0.0% | 19.1% | 0.0% | 16.8% |
| Thin Mucoid | N | 2 | 2 | 17 | 7 | 152 | 2 | 182 |
| | % | 100.0% | 100.0% | 100.0% | 100.0% | 69.1% | 100.0% | 72.8% |
| Total | N | 1 | 2 | 17 | 7 | 220 | 2 | 250 |

Chi-square = 12.737; p-value = 0.388 (not significant)

- This implies that the outcome of the PAP smear had no association with the type of discharge among the study population ($p > 0.05$).

**Table 10: Comparison of PAP smear outcome with Amount of Discharge (n = 250):**

| Amount of Discharge | | HSIL | ASC-H | ASCUS | LSIL | NILM | SCC | Total |
|---|---|---|---|---|---|---|---|---|
| Copious | N | 1 | 0 | 3 | 0 | 34 | 0 | 38 |
| | % | 50.0% | 0.0% | 17.6% | 0.0% | 15.5% | 0.0% | 15.2% |
| Minimal | N | 1 | 0 | 3 | 1 | 53 | 0 | 58 |
| | % | 50.0% | 0.0% | 17.6% | 14.3% | 24.1% | 0.0% | 23.2% |
| Moderate | N | 0 | 2 | 11 | 6 | 133 | 2 | 154 |
| | % | 100.0% | 100.0% | 64.7% | 85.7% | 60.5% | 100.0% | 61.6% |
| Total | N | 2 | 2 | 17 | 7 | 220 | 2 | 250 |

Chi-square = 13.787; p-value = 0.277 (not significant)

- This implies that the outcome of the PAP smear had no association with the amount of discharge among the study population ($p > 0.05$). (Table 9, 10)

**Table 11: Comparison of PAP smear outcome with Color of Discharge (n = 250):**

| Color of Discharge | | HSIL | ASC-H | ASCUS | LSIL | NILM | SCC | Total |
|---|---|---|---|---|---|---|---|---|
| Greenish-yellow | N | 0 | 0 | 0 | 0 | 20 | 0 | 20 |
| | % | 0.0% | 0.0% | 0.0% | 0.0% | 9.1% | 0.0% | 8.0% |
| Grey | N | 1 | 0 | 12 | 7 | 110 | 2 | 132 |
| | % | 50.0% | 0.0% | 70.6% | 100.0% | 50.0% | 100.0% | 52.8% |
| White | N | 1 | 2 | 5 | 0 | 90 | 0 | 98 |
| | % | 50.0% | 100.0% | 29.4% | 0.0% | 40.9% | 0.0% | 39.2% |
| Total | N | 2 | 2 | 17 | 7 | 220 | 2 | 250 |

Chi-square = 17.205; p-value = 0.242 (not significant)

- This implies that the outcome of the PAP smear had no association with the colour of discharge among the study population ($p > 0.05$).

**Table 12: Comparison of PAP smear outcome with Smell of Discharge (n = 250):**

| SOD | | HSIL | ASC-H | ASCUS | LSIL | NILM | SCC | Total |
|---|---|---|---|---|---|---|---|---|
| Absent | N | 1 | 1 | 15 | 7 | 166 | 1 | 191 |
| | % | 50.0% | 50.0% | 88.2% | 100.0% | 75.5% | 50.0% | 76.4% |
| Present | N | 1 | 1 | 2 | 0 | 54 | 1 | 59 |
| | % | 50.0% | 50.0% | 11.8% | 0.0% | 24.5% | 50.0% | 23.6% |
| Total | N | 2 | 2 | 17 | 7 | 220 | 2 | 250 |

Chi-square = 8.684; p-value = 0.192 (not significant)

- This implies that the outcome of the PAP smear had no association with the smell of discharge among the study population ($p > 0.05$). ( Table 11 and 12)

**Table 13: Outcome of Wet Mount for diagnosis of T. vaginalis (n = 228):**

| | | Frequency | Per cent |
|---|---|---|---|
| W.M. for T. vaginalis | Negative | 195 | 78.0 |
| | Positive | 33 | 13.2 |
| | Total | 228 | 100.0 |

- The outcome of Wet Mount for diagnosis of T. vaginalis among study participants, only 13.2% of study subjects were positive for T. vaginalis, and 78% of subjects were negative.

**Table 14: Potassium Hydroxide (KOH) Mount test for Fungal diagnosis (n = 228):**

| | | Frequency | Percent |
|---|---|---|---|
| KOH.M for fungus | Negative | 144 | 57.6 |
| | Positive | 84 | 33.6 |
| | Total | 228 | 100.0 |

- The outcome of Potassium Hydroxide (KOH) Mount for Fungal diagnosis among study participants, only 33.6% of study subjects were positive for fungal infection, and 57.6% of subjects were negative.

**Table 15: Gram staining test for bacterial diagnosis (n = 228):**

| | | Frequency | Percent |
|---|---|---|---|
| G.S. for Bacteria | Gram (+) Cocci | 99 | 39.6 |
| | Gram (-) Bacilli | 89 | 35.6 |
| | Negative | 40 | 16.0 |
| | Total | 228 | 100.0 |

- The outcome of Gram staining for Bacteria (prevalence of gram-positive/negative bacteria) among study participants, nearly 39.6% of study subjects had gram-positive cocci, and 35.6% had gram-negative bacilli, and 16% of subjects had a negative outcome. ( Table 13,14,15)

**Table 16: Bacterial Culture outcome among study participants (n = 228):**

| | | Frequency | Percent |
|---|---|---|---|
| Culture for Bacteria | E. coli | 72 | 28.8 |
| | Enterococcus | 14 | 5.6 |
| | K. oxytoca | 11 | 4.4 |
| | S. aureus | 85 | 34.0 |
| | P. aeruginosa | 6 | 2.4 |
| | Negative | 40 | 16.0 |
| | Total | 228 | 100.0 |

- The majority of females (34%) were seen to have S. aureus as observed on the bacterial culture of leucorrhoea secretions; followed by E. coli, which was the second-highest (28.8%) observation among study participants.
- A minor proportion of study subjects also presented with Enterococcus (5.6%), K. oxytoca (4.4%), and P. aeruginosa (2.4%). Around 16% of subjects had a negative outcome.

**Table 17: Fungi Culture outcome among study participants (n = 228):**

| | | Frequency | Percent |
|---|---|---|---|
| Culture for Fungi | C. glabrata | 8 | 3.2 |
| | C. parapsilosis | 5 | 2.0 |
| | C. albicans | 68 | 27.2 |
| | C. krusei | 3 | 1.2 |
| | Negative | 144 | 57.6 |
| | Total | 228 | 100.0 |

- The majority of females (27.2%) were seen to have the presence of C. albicans on the culture of leucorrhoeal secretions; followed by C. glabrata (3.2%), C. parapsilosis (2%), C. krusei (1.2%). Around 57.6% of subjects had no outcome (Table 16,17).

## DISCUSSION

The present study revealed that Leucorrhea is prevalent throughout life i.e. 18-45 years, but was highly prevalent in the 26-30 years age group. The findings are similar to study by Tabassum et al. in 2014 and Rudri et al. in 2017, among women 15-55 years old in Bangalore.[2,3]

The findings also correlate with the study by Devi U in 2013 in Nellore in which 50% of the women reporting leucorrhea belonged to the age group of 21-30 years.[4]

Culture for isolation of candida is a superior method in detecting vaginal candidal vaginosis. The incidence of candidiasis and TV reported in the current study were comparable to studies reported elsewhere[4,5,6] Overall prevalence of TV varies from place to place, study to study and ranges from 6-14.9%.[5]

The chief presenting complaint in the present study was white discharge which is characteristic of leucorrhea.[2] The consistency of discharge in the present study varied from thin mucoid (72.8%) to thick curdy (16.8%) and frothy (10.4%) in the current study. This is consistent with studies conducted in Banglore[3], Nellore[4] and Goa.[7]

The secretions due to noninfectious causes are non-purulent and non-offensive, nonirritant and never cause itching. Pruritis, dysuria and dyspareunia were present in 35.2%, 30% and 20% of the study participants in the present study. Itching is a common symptom in candidiasis, non-specific vaginitis and trichomoniasis. The findings correlate with the study done elsewhere.[4]

The mean duration of leucorrhoea in the present study was 2.89±1.32 days (Range: 1-6 days). This is in contrast to the findings reported elsewhere. In a study by Ilankoon et al in 2017 in women living in Colombo District, Sri Lanka, sought treatment at the end because the condition got worse or fear of serious disease consequences.[8]

Many women are not interested to discuss the symptom with their medical practitioner until matters reach such a stage that, despite their efforts at treatment, the persistence of discharge compels them to seek advice. This delay, coupled with the fact that many women regard quite a considerable amount of vaginal discharge as normal, has often the effect of making the complaint one of long duration when advice is first sought.[9]

Evidence indicates the minimal effect of OCP use on the vaginal epithelium and vaginal and cervical discharge, and a small effect on vaginal flora.[10] The findings of our study corroborated this evidence.

The prevalence of leucorrhoea among IUD users and tubectomized women was 51.2% and 25.2% respectively in the present study. This was much higher than reported by Devi in 2013 and Kulkarni et al in 2005 in Nagpur.[4,11]

The findings corroborated with the study done by Nwankwo et al in 2010 among women of the reproductive age group in Nigeria.[12] The IUCD has been reported to produce inflammation and changes in cervical cytopathology.

In the study done by Ocak et al in 2007 among women in Turkey, 20.7% of IUD users were reported to have leucorrhoea as against 8.8% OCP users.[13] Leucorrhea among IUD users is most strongly related to the insertion process and the background risk of STI.[14]

The PAP smear findings among patients in our study were similar to those reported by Sujatha et al in 2016, Yogita et al in 2014 and Karuna et al in 2003.[15-17] Thin mucoid discharge was associated with most PAP smear changes in the present study. This is consistent with findings by Parate et al in 2017.[18] Atypical squamous cells of undetermined significance (ASCUS) was associated with greyish discharge. The findings corroborated with studies done elsewhere.[15-19]

Patients diagnosed with TV infection reported varied colour discharge (greenish-yellow to white). Usually, TV infection among women results in a clear, white, greenish, yellow discharge with an unusual fishy smell.[20] In the current study too, one-third of the patients reported foul-smelling discharge.

## CONCLUSION

The present study revealed that Leucorrhea is prevalent throughout life i.e. 18-45 years, but was highly prevalent in the 26-30 years age group. Married females are at a greater risk for leucorrhoea as they are exposed to sexual activity and frequent childbearing which may lead to vaginal infections, cervicitis, cervical erosion, pelvic inflammatory disease etc. that could lead to leucorrhoea in these women.

Infection of vaginal mucosa by Trichomonas vaginalis and Candida is the most common cause of leucorrhoea. The most common causes of Leucorrhea in our study were: Gram-positive cocci (39.6%), Gram-negative bacilli (35.6%), Fungal/candidiasis (33.6%) and Trichomonas vaginalis (TV) (13.2%).

The chief presenting complaint in the present study was white discharge which is characteristic of leucorrhea.[1] The consistency of discharge in the present study varied from thin mucoid (72.8%) to thick curdy (16.8%) and frothy (10.4%) in the current study.

Pruritis, dysuria and dyspareunia were present in 35.2%, 30% and 20% of the study participants in the present study. Itching is a common symptom in candidiasis, non-specific vaginitis and trichomoniasis. The mean duration of leucorrhoea in the present study was 2.89±1.32 days (Range: 1-6 days). The prevalence of leucorrhoea among IUD users and

tubectomised women was 51.2% and 25.2% respectively in the present study.

Patients diagnosed with TV infection reported varied colour discharge (greenish-yellow to white). Usually, TV infection among women results in a clear, white, greenish, yellow discharge with an unusual fishy smell.[19] In the current study too, one-third of the patients reported foul-smelling discharge. Patients with fungal infection in the present study reported white and grey discharge. The foul smell was present in 17.9% of the patients with a candida infection.

A significant association of leucorrhoea with socio-demographic factors, clinical features, PAP smear, bacterial as well as fungal culture in the present study emphasizes the need for health education and preventive practices related to personal & menstrual hygiene & family planning practices in females.

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