



## Laboratory Profiles of Women Presented with Pelvic Inflammatory Disease

Ismat Ara Laizu<sup>1</sup>, Laila Anjuman Banu<sup>2</sup>, Fowzia Abul Fayez<sup>3</sup>, Shimul Akter<sup>4</sup>

<sup>1</sup>Senior Consultant, Department of Gynaecology & Obstetrics, Mugda Medical College & Hospital, Dhaka, Bangladesh; <sup>2</sup>Associate Professor, Department of Gynaecology & Obstetrics, Mugda Medical College, Dhaka, Bangladesh; <sup>3</sup>Junior Consultant (Gynae), Muradnagar Upazila Health Complex, Muradnagar, Cumilla, Bangladesh; <sup>4</sup>Associate Professor, Department of Gynaecology and Obstetrics, Monowara Sikder Medical College, Shariatpur, Bangladesh

[Received: 12 April 2021; Accepted: 30 May 2021; Published: 1 June 2021]

### Abstract

**Background:** Laboratory investigations has a great role for the detection of pelvic Inflammatory disease among women. **Objectives:** The purpose of the present study was to see the laboratory profiles of women presented with pelvic inflammatory diseases during reproductive age group. **Methodology:** This cross-sectional study was carried out in the Department of Obstetrics and Gynaecology at Mymensingh Medical College Hospital, Mymensingh, Bangladesh from January 2008 to June 2009 for a period of one (01) and a half year. Women who were presented with pelvic inflammatory disease (PID) attended at the OPD of gynecology Department at Mymensingh Medical College Hospital, Mymensingh, Bangladesh were selected as study population. Laboratory investigations of each patient were taken and were recorded. **Result:** A total number of 300 cases were recruited. The mean age with SD was 30.3±9.57 years. In this present study 92(30.7%) patients had haemoglobin level less than 60.0%. The total count of WBC was counted and was found that majority had normal count which was 246(82.0%) cases. Culture of endocervical swab was done in 86 cases of which 34(39.5%) cases showed a growth of bacteria. The most common isolated bacteria was *Escherichia coli* which was 28(82.0%) cases followed by the growth of *Staphylococcus aureus* which was in 6(18.0%) cases. **Conclusion:** In conclusion haemoglobin level, total count of WBC are most commonly found among the women presented with pelvic inflammatory diseases with the predominance of *Escherichia coli*. [Bangladesh Journal of Infectious Diseases, June 2021;8(1):3-6]

**Keywords:** Laboratory profiles; women; pelvic inflammatory disease

**Correspondence:** Dr. Ismat Ara Laizu, Senior Consultant, Department of Gynaecology & Obstetrics, Mugda Medical College & Hospital, Dhaka, Bangladesh. E-mail: laizuismat@gmail.com; Cell no.: +8801785872929

**Conflict of interest:** No conflict of interest

**Funding agency:** None

**Contribution to authors:** Laizu IA, Banu LA, Fayz FA involved in protocol preparation, data collection and literature search up to manuscript writing; Akter S corrected the manuscript.

**How to cite this article:** Laizu IA, Banu LA, Fayz FA, Akter S. Laboratory Profiles of Women Presented with Pelvic Inflammatory Disease. Bangladesh J Infect Dis 2021;8(1):3-6

**Copyright:** ©2021. Laizu et al. Published by Bangladesh Journal of Infectious Diseases. This article is published under the Creative Commons CC BY-NC License (<https://creativecommons.org/licenses/by-nc/4.0/>). This license permits use, distribution and reproduction in any medium, provided the original work is properly cited, and is not used for commercial purposes.

### Introduction

The genital tract is especially susceptible to infection after childbirth and abortion<sup>1</sup>. The genital tract defenses are temporarily broken down during and immediately after labour<sup>2</sup>. At this time the

genital tract is especially vulnerable to infections. Moreover, this gives an opportunity for potential pathogens to pass from the lower genital tract into the normally sterile environment of the uterus<sup>3</sup>. Once the organisms have reached the decidua, they can readily spread to the myometrium, the

parametrium and the fallopian tubes and from there to the peritoneum and the peripheral circulation. It is more common, however, for the infection to remain localized in the pelvis and if treatment is not immediate and effective, there is a danger of chronic pelvic infection with tubal blockage<sup>4</sup>.

Features which predispose to puerperal pelvic infection are a history of prolonged rupture of membrane or a prolong labour with multiple vaginal examinations<sup>5</sup>. If there are retained products of conception or organized blood clot in the uterus these can act as ideal culture media.

In abortion particularly when this has been induced by a nonmedical person or untrained person is potentially septic<sup>6</sup>, because the abortionist and the environment are generally dirty and the damage caused by crude instruments or objects provides an ideal culture medium for organisms present in post abortion or which are introduced during the procedure<sup>7</sup>. An illegal abortion can be one hundred times or more dangerous than a legal termination of pregnancy in the hand of an expert<sup>8</sup>. The purpose of the present study was to see the laboratory profiles of women presented with pelvic inflammatory diseases during reproductive age group.

### Methodology

This study was designed as descriptive cross-sectional study. This study was carried out in the Department of Obstetrics and Gynaecology at Mymensingh Medical College Hospital, Mymensingh, Bangladesh from January 2008 to December 2008 for a period of one (01) year. Women at any age who were suffering from pelvic inflammatory disease (PID) attended at the OPD of gynecology Department at Mymensingh Medical College Hospital, Mymensingh, Bangladesh were selected as study population. Clinically the patients were diagnosed with the presence of at least three of the symptoms as well as the signs. Subsequently, each patient were underwent the investigations like CBC, ESR, total count, endocervical swab for culture and sensitivity and ultra-sonogram of lower abdomen. Relevant data from each patient were recorded in a questionnaire. Data were analyzed by SPSS version 21.0 software package. All data were recorded systematically in a preformed data collection sheet. The quantitative data were expressed as frequency and percentage and the quantitative data were expressed as mean with standard deviation.

### Result

A total number of 300 cases were recruited after fulfilling the inclusion and exclusion criteria. Among 300 cases of pelvic inflammatory disease, most of the study population were in the ge group of less than 35 years of age which was 262(87.3%) cases and the rest of the 38(12.7%) cases were in the more than 35 years of age group. The mean age with SD was 30.3±9.57 with the range of minimum 18 years and maximum 49 years (Table 1).

**Table 1: Age Distribution of the Patients (n=300)**

Age Group	Frequency	Percent
Less Than 35 Years	262	87.3
More than 35 Years	38	12.7
<b>Total</b>	<b>300</b>	<b>100.0</b>
<b>Mean±SD (Range)</b>	30.3±9.57 (18 to 49)	

In this present study 92(30.7%) patients had haemoglobin level less than 60.0% and the rest of 208(69.3%) cases had more than 60.0% haemoglobin level. The total count of WBC was counted and was found that majority had normal count which was 246(82.0%) cases and only 54(18.0%) cases had leukocytosis. ESR was elevated in 66(22.0%) cases and the rest of the study population had normal ESR which was 66(22.0%) cases (Table 2).

**Table 2: Haematological Findings among the Study Population**

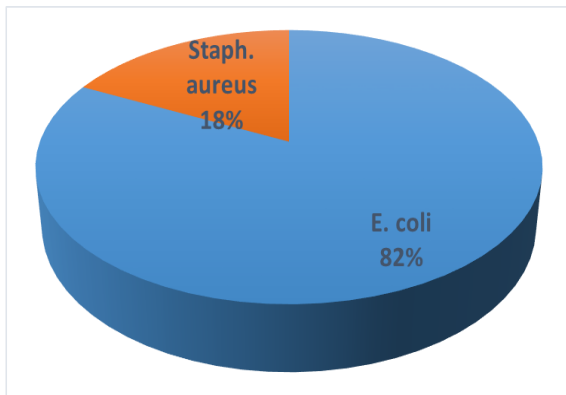
Variables	Frequency	Percent
<b>Heamoglobin Level</b>		
Less Than 60 Percent	92	30.7
More Than 60 Percent	208	69.3
<b>Total Count of WBC</b>		
4000 to 11000/cumm	246	82.0
More Than 11000/cumm	54	18.0
<b>ESR (mm/1<sup>st</sup> hr)</b>		
Normal	234	78.0
Elevated	66	22.0

Culture sensitivity of endocervical swab was done in 86 cases. The result had showed a growth of 34(39.5%) cases and the rest of 52(60.5%) cases had shown no growth of bacteria after culture in aerobic condition at 37<sup>0</sup> C for 72 hours in the incubator (Table 3).

**Table 3: Bacteriological Culture of Endocervical Swab (n=86)**

Culture of Bacteria	Frequency	Percent
Growth Positive	34	39.5
Growth Negative	52	60.5
<b>Total</b>	<b>86</b>	<b>100.0</b>

Culture of endocervical swab had showed that most of the isolated bacteria was *Escherichia coli* which was 28(82.0%) cases followed by the growth of *Staphylococcus aureus* which was in 6(18.0%) cases. No other bacteria was isolated from this aerobic culture of bacteria (Figure I).



**Figure I: Bacterial Growth in the Culture of Endocervical Swab**

### Discussion

The detailed and methodical study of 300 cases in this series shows highest (54.3%) incidence of this disease being in the age group of 26 to 35 years. Khan et al<sup>11</sup> have also showed that women with PID are usually under the age of 25 years. Simms et al<sup>12</sup> showed that 87.0% patients belong to the age group 20 to 35 years. There is similarity between this last study which was conducted in India, with the present study. Laila<sup>13</sup> also showed that 55.21% of her patients were in the age group of 26 to 35 years. PID occurs more in younger age group in western countries where the disease is mainly STD related, but in developing countries, it is mostly non-STD related and occurs in later age group<sup>11</sup>. Chronic pelvic inflammatory disease is never seen in prepubertal women and very rarely after the menopause. The most frequent age of involvement is between 15 and 25 years. This peak age reflect the sexual activities of this group of women. Patients are mostly multiparous. Most of them are having no antenatal checkup and have a home delivery which is conducted by relatives or dais<sup>9</sup>. There may be pelvic infection following child birth; however, many of the patients have a previous history of spontaneous or induced abortion or MR by unskilled person<sup>14</sup>.

Younger age is marked by biological characteristics conducive to the development of PID, such as a

lower prevalence of protective chlamydial antibody, larger zone of cervical ectopy and greater permeability of cervical mucosa<sup>15</sup>. A correlation between early coital indulgence and promiscuous sexual relationship might explain the very high salpingitis incidence in sexually active teenage girls. However, STD is less important for development of PID in the somewhat older women. In this age group of patients and also in women who have had two or more episodes of PID, anaerobic bacteria is thought to be the aetiological agent. The reason behind this may be the post PID fallopian tubes are more vulnerable to infections by anaerobes<sup>16</sup>. Anatomic changes induced by pregnancy and delivery contribute to an easier access to the vagina for bowel flora. This may lead to an increased occurrence of a type of non-venereal PID in women of comparatively higher age.

The limited number of investigations have been done. Routine blood examination has been shown leucocytosis in 18 percent cases, which may be due to superimposition of active infection on chronic changes<sup>8</sup>. Among all patients, 22.0% cases had raised ESR which may be due to presence of a chronic inflammatory state. In chronic PID, it is rare to isolate the causative organism from the endocervical swab. In this study endocervical swab for culture and sensitivity done in 43 cases only showed that in 9.3 percent cases, the isolated organism was *E. coli* and in 2 percent it was *S. aureus*<sup>17</sup>.

The aetiological role of *C. trachomatis* and *N. gonorrhoea* in pelvic infection cannot be denied. A multicentre case control study using the sophisticated method of detection of antibody against *C. trachomatis* and *N. gonorrhoea* showed that 93.0% women with bilateral tubal occlusion had antibodies to one or both STDs compared to 40 percent of the control<sup>18</sup>. The mode of infection by these organisms is ascending type that is they ascend through the uterus and along the tubes to produce an endosalpingitis. This ascent of infection is also favoured by the presence of cervical tear or patulous cervical os. Due to prolonged labour, there is tearing of the muscle fibers of the cervix, so it never closes by mucous plug. In the absence of mucous plug, with each coitus, sperm goes into the uterine cavity in enormous number. Both motile spermatozoa and trichomonads have been postulated as carrier<sup>19</sup>. If there is orgasm, there is contraction of the upper genital tract, thereby a negative pressure is created which aids the entry of more semen carrying with it dirty vaginal discharge<sup>14</sup>. Therefore, it is common in parous women who lead active sexual life. Perineal tear,

low down uterus also favours ascending infection. Human immunodeficiency virus does not affect microbial cause of pelvic inflammatory disease but women with acute PID and seropositivity have an altered immune response, resulting in inadequate response to antimicrobial agents and need for more surgical intervention.

## Conclusion

In conclusion haemoglobin level is found normal in majority of cases, however, low level of haemoglobin is also reported. The total count of WBC is high in a significant number of cases. ESR is found high in majority of the women presented with pelvic inflammatory diseases. The most commonly found bacterial agent is *Escherichia coli* and *Staphylococcus aureus*. However, a large scale study should be carried out to see the real scenario.

## References

1. Haggerty CL, Ness RB. Diagnosis and treatment of pelvic inflammatory disease. *Women's Health*. 2008;4(4):383-97
2. Brunham RC, Gottlieb SL, Paavonen J. Pelvic inflammatory disease. *New England Journal of Medicine*. 2015;372(21):2039-48.
3. Crossman SH. The challenge of pelvic inflammatory disease. *American family physician*. 2006;73(5):859-64.
4. Wiesenfeld HC, Hillier SL, Meyn LA, Amortegui AJ, Sweet RL. Subclinical pelvic inflammatory disease and infertility. *Obstetrics & Gynecology*. 2012;120(1):37-43.
5. Haggerty CL, Ness RB. Epidemiology, pathogenesis and treatment of pelvic inflammatory disease. *Expert review of anti-infective therapy*. 2006;4(2):235-47.
6. Gray-Swain MR, Peipert JF. Pelvic inflammatory disease in adolescents. *Current Opinion in Obstetrics and Gynecology*. 2006;18(5):503-10.
7. Barrett S, Taylor C. A review on pelvic inflammatory disease. *International journal of STD & AIDS*. 2005;16(11):715-20
8. Dayan L. Pelvic inflammatory disease. *Australian family physician*. 2006 Nov;35(11)
9. Lareau SM, Beigi RH. Pelvic inflammatory disease and tubo-ovarian abscess. *Infectious disease clinics of North*

America. 2008;22(4):693-708

10. Viberga I, Odland V, Lazdane G, Kroica J, Berglund L, Olofsson S. Microbiology profile in women with pelvic inflammatory disease in relation to IUD use. *Infectious diseases in obstetrics and gynecology*. 2005 Dec 1;13(4):183-90
11. Khan N, Rahman F, Jahan N, Khatun R, Saha N. Clinical Profiles of Pelvic Inflammatory Disease Patients: Experience of 150 Cases at a Tertiary Care Hospital in Dhaka City. *Journal of National Institute of Neurosciences Bangladesh*. 2018;4(2):129-32
12. Simms I, Stephenson JM, Mallinson H, Peeling RW, Thomas K, Gokhale R, Rogers PA, Hay P, Oakeshott P, Hopwood J, Birley H. Risk factors associated with pelvic inflammatory disease. *Sexually transmitted infections*. 2006;82(6):452-7
13. Laila R. Study of 192 cases of chronic PID in GOPD of Dhaka Medical College Hospital (dissertation), Dhaka: Bangladesh College of Physicians and Surgeons, 1997
14. Viberga I, Odland V, Lazdane G, Kroica J, Berglund L, Olofsson S. Microbiology profile in women with pelvic inflammatory disease in relation to IUD use. *Infectious Diseases in Obstetrics and Gynecology*. 2005;13(4):183-90
15. Petrina MA, Cosentino LA, Wiesenfeld HC, Darville T, Hillier SL. Susceptibility of endometrial isolates recovered from women with clinical pelvic inflammatory disease or histological endometritis to antimicrobial agents. *Anaerobe*. 2019;56:61-5
16. Workowski KA, Berman SM. Centers for Disease Control and Prevention sexually transmitted disease treatment guidelines. *Clinical Infectious Diseases*. 2011;53(suppl\_3):S59-63
17. Geisler WM. Diagnosis and management of uncomplicated Chlamydia trachomatis infections in adolescents and adults: summary of evidence reviewed for the 2010 Centers for Disease Control and Prevention Sexually Transmitted Diseases Treatment Guidelines. *Clinical infectious diseases*. 2011;53(suppl\_3):S92-8
18. Sultana S. Aetiological aspect of chronic PID: a case report of 349 cases in GOPD (dissertation), Dhaka: Bangladesh College of Physicians and Surgeons, 1996
19. Jaiyeoba O, Soper DE. A practical approach to the diagnosis of pelvic inflammatory disease. *Infectious diseases in obstetrics and gynecology*. 2011 Jan 1;2011