

**ORIGINAL ARTICLE****Detection of Relationship Between Female Infertility and Pelvic Inflammatory Disease at Zagazig University Hospitals.**Mohamed E. Mohamed<sup>1</sup>, Wael S. Nossair<sup>1</sup>, Mustafa T. Abdel-Fattah, Azahir K. Elsharif<sup>1</sup>*Obstetrics and Gynecology Department, Faculty of Medicine, Zagazig University, Zagazig, Egypt***Corresponding author**Azahir Kamil Elsharif  
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[azaaaaahir@gmail.com](mailto:azaaaaahir@gmail.com)**Submit Date** 2020-10-30  
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**Accept Date** 2020-12-09**ABSTRACT**

**Background:** Infertility is a 2-year inability to conceive following routine unprotected sexual activity in the absence of established reproductive pathology. PID is typically the result of endocervical infection that triggers endometritis, salpingitis, parametritis, oophoritis, ovarian abscess and pelvic peritonitis. Delays of just a few days in receiving adequate treatment particularly in Chlamydia infections significantly increase the risk of infertility. The purpose of the present study was to detect female infertility early among 191 women with infertility complaining from pelvic inflammatory disease selected from the Outpatient Clinics of Gynecology and Obstetric Department, Zagazig University Hospitals.

**Methods:** All women were subjected to full history taking. General, abdominal and local examinations were done to all women for the presence of any cervical lesions. Positive result supported the diagnosis of PID, if available with the patient from the past. Written informed consent was obtained from all participants, the study was approved by the research ethical committee of Faculty of Medicine, Zagazig University. The study was done according to The Code of Ethics of the World Medical Association (Declaration of Helsinki) for studies involving humans.

**Results:** The age of the studied group ranged from 17 to 36 years, husband age ranged from 18 to 42, 68.1% of the case group had PID, 60.2% of them had married from 1 to 5 years, 75.4% were housewives, 81.2% were non-educated, 55.5% were nulliparous, 69.2% were rural resident and 67.1% were of high social class. There were statistically significant differences between positive and negative PID patients regarding parity, social class, methods of contraception, reported history of PID, hospitalization due to PID, WBCs and using IUD as contraception.

**Conclusions:** There was a strong relation between infertility and pelvic inflammatory disease.

**Keywords:** Female infertility; Pelvic inflammatory disease.

**INTRODUCTION**

Infertility is commonly characterized as a one-year unprotected intercourse without conception. Approximately 30% of cases of infertility are female. During a female infertility examination, certain signs or family history will suggest a reproductive disorder test. Two of the most common factors relating to female infertility are endometriosis and polycystic ovarian syndrome [1].

Pelvic inflammatory disease (PID) is caused by inflammation from the vagina and cervix to the upper genital tract. Chlamydia trachomatis is the prevalent PID-associated sexually transmitted organism. In the United States, over eight hundred thousand individuals are diagnosed with pelvic

inflammatory disease (PID) every year. According to the Centre for Disease Control and Prevention (CDC), when considering missed PID cases, the number of cases can reach up to a million a year. The serious complications of PID make these rates of a huge concern. Ectopic pregnancy, chronic pelvic pain (CPP), and tubal infertility are among these complications [2].

PID is caused by infections affecting the pelvic peritoneum, ovaries, fallopian tubes, and the endometrium in the female reproductive tract. PID treatment should be considered in any female with lower pain with no obvious cause, and at least one of the following criteria: tender uterus, tender cervix, and tender adnexa [3].

There has been a reported correlation between acute pelvic inflammatory disease (PID) and

sequelae such as tubal factor infertility and ectopic pregnancy. The rate of infertility after a PID episode correlates most closely with the degree of tubal damage shown by laparoscopy during an acute PID episode. Infertility resulted in 3% of mild tubal damage patients, 13% of moderate tubal damage patients, and 29% of laparoscopically observed extreme tubal damage patients [4].

Songer et al. [5] The importance attributed by women with pelvic inflammatory disease (PID) to the health effects of potential infertility has been established. They concluded that the majority of PID women rate potential infertility as a major problem. The quality of life for such women may be influenced by optimizing access to infertility care. The aim of this work is to early detect female infertility among women complaining from pelvic inflammatory disease.

## METHODS

This cross-sectional case series study was carried out on 191 infertile women selected from the Outpatient Clinics of the Obstetrics and Gynecology Department, Faculty of Medicine, Zagazig University Hospitals during the period from February 2019 to September 2019. Written informed consent was obtained from all participants, the study was approved by the research ethical committee of Faculty of Medicine, Zagazig University. The study was done according to The Code of Ethics of the World Medical Association (Declaration of Helsinki) for studies involving humans.

Inclusion criteria were including patients who was on follow up at assisted reproduction unit confirmed as tubal infertility by laparoscopic or Doppler study. Women with infertility with past history of admission by pelvic inflammatory disease or gynecological procedure related to PID. Women with infertility and had past PID signs or symptoms or her husband had STDs will be included in addition to women who used IUD, women with past history of ectopic pregnancy and tubal- ovarian abscess or other PID complications. Exclusion criteria were involving Male infertility. Separation of relation or not regular sexual intercourse. Anovulation (PCOs). Hormonal axis abnormalities or anatomical abnormalities were excluded. Uterine anatomical abnormalities. Vaginal and valvular anatomical or pathological abnormalities. Women with primary infertility due to genetic or chromosomal abnormalities were excluded. Methods was done such as full history taking, Personal history, Age and residence. Menstrual history: One week of menstrual cycle at time of examination. Fertility condition: Primary infertile or secondary infertility.

Clinical examination were comprise general, abdominal and local examinations were done to all women for the presence of any cervical lesions (cervicitis or cervical erosion).

Laboratory investigations including semen analysis, swap, positive result supporting the diagnosis of PID, if available with the patient from the past.

Specific reports have Laproscopic or Doppler US report if the patient underwent them.

Hospital admission have Hospital admission record of the patient if she was admitted by PID complication.

## Statistical Analysis

Using Epi-Info version 6 and SPP for Windows version 8, the data was reviewed and analysed. The arithmetical mean, standard deviation, median, student t test, and chi-squared test were used to summarise results. The importance threshold is set at the level of 5 percent (p-value).

The results were considered:

Important when there is less than 5 percent likelihood of error ( $p < 0.05$ ).

Non-significant when there is more than 5% risk of error ( $p > 0.05$ ).

Extremely important if the likelihood of error is less than 0.1% ( $p < 0.001$ ).

The smaller the p-value obtained, the more significant the findings are.

## RESULTS

Table (1) shows that the age of the studied group ranged from (17 to 36) years, husband age ranged from (18 to 42), (60.2%) of them had married from (1 to 5) years, (75.4%) were housewives, (81.2%) were non-educated, (55.5%) were nulliparous, (69.2%) were rural resident and (67.1%) were of high social class.

Table (2) shows complete obstetric, gynecological and sexual history of the studied group. Table (3) shows complete symptoms and signs of the studied group. Table (4) and figure (1) show that (68.1%) of the case group had PID.

In table (5), there was statistically significant difference between positive and negative PID patient's parity and social class. But regarding other variables, there was no statistically significant difference.

In table (6), there was statistically significant difference between positive and negative PID patients regarding methods of contraception, repeated history of PID and hospitalization due to PID. But regarding other variables, there was no statistically significant difference.

In table (7), There has been a statistically important discrepancy between positive and negative PID patients regarding using IUD as contraception. But

regarding others, there was no statistically significant difference

**Table (1):** Socio-demographic characteristics among the studied group

Variable	The case group(191) mean ± SD (Range) median	
Female age (Years)	22.3±4.2 (17-36) 24	
Husband age (Years)	32.4±14.5 (18-42) 33	
Duration of marriage (Years)	5.9±14.5 (1year-12years) 5	
Variable	NO(191)	%
Female age groups		
≤ 20 years	67	35.1%
20-25 years	90	47.1%
≥ 25 years	34	17.8%
Husband age groups		
≤ 20 years	27	14.2%
20-25 years	82	42.9%
≥ 25 years	82	42.9%
Duration of marriage		
1 years	62	32.5%
> 1 - 5 years	115	60.2%
≥5 years	14	7.3%
Occupation		
House wife	144	75.4%
working	47	24.6%
Education		
Educated	36	18.8%
Non-educated	155	81.2%
Parity		
Nulliparous	106	55.5%
1	25	13.1%
≥ 2	60	31.4%
Residence		
Urban	59	30.8%
rural	132	69.2%
Socio-economic status		
High	27	67.1%
Moderate	36	18.8%
Low	128	14.1%

**Table (2):** Obstetric, gynecological and sexual history of the studied group

Variable	The studied group(191) mean ± SD (Range) median
Age at menarche (years)	14.1±0.92 (12-16) 14

Variable	The studied group(191)	
	mean ± SD (Range) median	
Last baby of secondary infertility cases was born Since (years)	3.5±1.9 (2-7) 3	
Variable	NO(191)	%
Type of infertility		
Primary	106	55.5%
Secondary	85	44.5%
Mode of delivery in last baby of secondary infertility cases	(85)	
Vaginal delivery	40	47.1%
C.S	45	52.9%
Last baby of secondary infertility cases was born Since	(85)	
≤ 3years	32	37.6%
More than 3 years	53	62.3%
Contraception method used in the past		
IUD	36	18.8%
Other methods	155	81.2%
If used IUD before	(36)	
Once	9	25.0%
Twice	24	66.7%
More than two	3	8.3%
Normal menstrual cycle pattern		
Yes	102	53.4%
No	89	46.6%
Reported history of PID		
Yes	109	57.1%
No	82	42.9%
Reported history of ectopic pregnancy		
Yes	160	83.8%
No	31	16.2%
History of miscarriage		
Yes	69	36.1%
No	122	63.9%
Frequency of sexual intercourse/week		
Once	89	46.6%
more	102	53.4%
Husband has other partners		
Yes	9	4.7%
No	146	76.4%
Not sure	36	18.9%
History of hospitalization due to PID		
Yes	10	5.2%
No	181	94.8%

**Table (3):** Symptoms and signs of PID according to (composite clinical criteria) in the studied group

Variables	NO.(191)	%
Abnormal vaginal bleeding	10	5.2%
Dyspareunia	42	22.0%

Variables	NO.(191)	%
<i>Itching</i>	50	26.2%
<i>Dysuria</i>	43	22.5%
<i>Fever</i>	40	20.9%
<i>Lower abdominal pain</i>	127	66.5%
<i>Vaginal discharge</i>	105	54.9%
<i>Discharge color</i>	(105)	
<i>No color</i>	19	18.1%
<i>Whitish</i>	10	9.6%
<i>Brownish</i>	42	3.8%
<i>yellowish</i>	34	32.4%
<i>Discharge odour</i>	(105)	
<i>No</i>	75	71.4%
<i>Offensive</i>	30	28.6%
<i>Speculum examination</i>		
<i>Normal cervix shape and colour</i>	140	73.3%
<i>Abnormal cervix</i>	51	26.7%
<i>Cervical excitation(motion tenderness)</i>		
<i>Yes</i>	168	87.9%
<i>No</i>	23	12.1%
<i>Abnormal U/S finding (susceptible PID)</i>		
<i>Yes</i>	32	16.7%
<i>No</i>	159	83.3%
<i>Previous HSG report</i>	20	10.5%
<i>Abnormal</i>	171	89.5%
<i>Not done</i>		

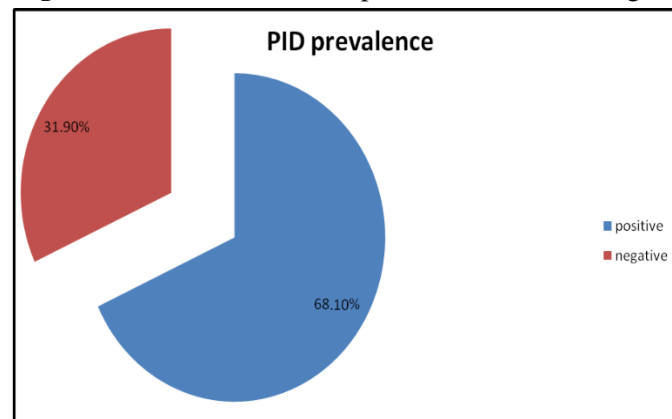
**Table (4):** Prevalence of PID in the studied group

PID	NO(191)	%
<i>Positive</i>	130	68.1%
<i>Negative</i>	61	31.9%

**Table (5):** Comparing risk factors between positive and negative PID patients

Variable	positive PID		negative PID		$\chi^2$	p-value
	No(130)	%	No(61)	%		
<b>passive smoking</b>						
<i>yes</i>	76	58.5%	24	39.3%	3.5	0.6
<i>no</i>	45	41.5%	37	60.7%		
<b>D.M</b>					1.8	0.6
<i>yes</i>	12	9.2%	2	3.3%		
<i>no</i>	118	90.8%	59	96.7%		
<b>Used IUD as contraception</b>					5.7	<b>0.03*</b>
<i>yes</i>	30	23.1%	6	9.8%		
<i>no</i>	100	76.9%	55	90.2%		
<b>Regular use of vaginal douches</b>					0.8	0.9
<i>yes</i>	76	58.5%	32	52.5%		
<i>no</i>	54	41.5%	29	47.5%		

**Figure (1):** Pie chart for PID prevalence in the case group



### DISCUSSION

Benign prostate hyperplasia (BPH) are heterogeneous disorders with a wide array of clinical presentations and high prevalence among men [9]. It is a common disease of the ageing male population significantly impact quality of life by causing lower urinary tract symptoms [10].

The incidence of benign prostatic hyperplasia (BPH) is 50-60 % in the 6th decade of life and increases to 80-90% in the 7th and 8th decades of life [11]. Lower urinary tract symptoms (LUTS) due to BPH pose a very common problem for urologists [2].

Transurethral resection of the prostate (TURP) is considered the gold standard for male lower urinary tract symptoms (LUTS) secondary to benign prostatic hyperplasia (BPH) ,but is associated with significant morbidity and long-term complications including stricture (7%), surgical revision (6%), significant urinary tract infection (4%), bleeding requiring blood transfusion (3%), incontinence (3%), transurethral resection syndrome (1%), erectile dysfunction (10%), and ejaculatory dysfunction (65%) [12].

Seeking solution to get an ideal surgical maneuver reaching perfection regarding safety and efficacy, many attempts aiming at minimizing (TURP) bleeding had been carried out. most of this trial depending on the idea of using some drugs that produce a decrease in prostate and attenuating its vasculature (due to androgen deprivation) prior to the procedure [13].

In our study, there was no significant difference between control, CPA and dutasteride groups regarding mean IPSS and mean prostate size.

A similar study conducted by **El-Gamal et al. [4]**, reported that there was no significant difference between the studied groups regarding prostate size was. This can attribute to the tendency of patients to delay the operation as much as possible.

Regarding the operative time of TURP we found the mean operative time was significantly reduced in CPA and dutasteride groups in comparison to

control group with no significant difference among two groups, this result similar to **El-Gamal, et al., [4]** after two weeks pre operative treatment with CPA, who reported that operative time was significantly less in CPA group than control group.

Also our result in agreement to that reported by **Kravchick et al. [14]** in their study after the 6-week pre-treatment with dutasteride who reported mean operative time was 50.55 min, 42.65 min in control group and dutasteride group respectively, the results of these studies revealed reduction of prostatic blood flow after short-term of oral therapy with dutasteride ,CPA which is lead to clear operative field throughout the procedures ,due to less time needed for coagulation.

In our study, we assessed operative blood loss by comparing Hemoglobin level and haematocrit value pre and post operative, which revealed marked significant drop in HB level and HCT value in Control group post operative than other two groups with no significant difference between CPA and dutasteride groups, and all group decreased significantly from pre to post but more in control. Our results showed that CPA group was statistically significant less drop in HB and HCT post operative than other two groups , with highly significant p value =0.00\*\*) this observation was in accordance to that reported by **Kim et al.[15]** after dutasteride administrated 2weeks pre operatively who revealed statistically significant difference regarding hemoglobin decrease post operative between control and dutasteride groups with significant p value p=0.011; and similarly **El-Gamal et al. [4]**, who reported that hematocrit value was less decreased in CPA group than control group with statistically significant p value p= 0.00\*),this effect explained by its capability to decrease the expression of androgen dependent VEGF and angiogenesis which is significantly reduce microvessel density in prostatic periurethral tissue.



Also our result in agreement with **Woo et al [16]** who reported that pre-operative treatment with dutasteride for two weeks before TURP, Hb and Hct declined less in group 1 (dutasteride) than in group 2 (controls) with statistical significant difference which explained by significant decrease in microvessels density in suburethral portion of prostate after treatment with dutasteride.

A similar finding was also described when finasteride was used before TURP in the studies of **Donohue et al. [17]**, **Özdal et al. [18]** and **Di Tonno et al. [19]**, who reported that the researchers believed that this reduction is likely due to rapid short-term alterations in prostatic blood flow.

Considering the Hospital stay in our study it was significantly longer in control group than CPA and dutasteride groups with no significant difference among two groups, with statistically highly significant in relation to control group, this result was in accordance with **Kim et al. [15]** who revealed significant decrease in hospitalization days after TURP in dutasteride group than control group with statistically significant p value ( $p=0.01$ ), and also in agreement with the study of **El-Gamal et al. [4]** who reported less hospital stay in CPA group with statistically significant p value ( $p=0.001$ ), which was attributed to less postoperative care of TURP including less need for blood transfusion and continuous bladder irrigation and maintenance of a urethral Foley catheter until hematuria ceased and hospitalization, all of which were lower in pre-treatment group related to reduce prostate tissue vascularity.

In our study the need for blood transfusion was less in both CPA and Dutasteride group in comparing to control group, these result in agreement with that reported by **El-Gamal et al. [4]** who need for blood transfusion in CPA and control group, also the study of **Kravchick et al. [14]** who reported no patients in the dutasteride group needed a postoperative blood transfusion, in comparison with transfusions required by 2 patients in the control group, similar result reported in the study of **Kim et al. [15]** who reported that there was no patients in the dutasteride group needed transfusion after pretreatment with dutasteride.

Regarding post operative fluid irrigation, our study revealed statically significant reduced fluid irrigation after the use of CPA and dutasteride in comparison to control group with high significant difference ( $p=0.00^{**}$ ) on other hand Dutasteride group was significantly higher than Cyproterone group.

A similar result reported by **Kravchick et al. [14]** who revealed that there was a significant difference regarding post operative fluid irrigation in dutasteride group and control group, also our study in agreement with the study of **Kim et al. [7]** who reported significant decrease in duration of post-operative irrigation in dutasteride group than control group with a significant difference between studied group. Our results also in agreement with the study of **El-Gamal et al. [4]** who demonstrated that fluid irrigation was significantly reduced after the use of CPA with significant difference between studied group.

Our study There was a statically significant association between Blood transfusion and Grade II Clavien-Dindo classification of complication, also grade Control group was significantly associated with clot retention and blood transfusion.

Although the adverse side effects of these agents are thought to be minimal, the magnitude of adverse effects on sexual function (diminished libido and erectile dysfunction) gynecomastia, depression, and quality of life remains ill-defined [20]. Also, Cyproterone acetate has the advantage of immediate effectiveness, but some side effects are described. These adverse effects include loss of libido, erectile dysfunction, cardiovascular and hepatic toxicities [4].

**Conclusions:** The pre-operative use of anti-androgen drugs (CPA & dutasteride) in TURP of large size prostate is well tolerated in the properly selected patients and it can help in decreasing the perioperative bleeding and fluid absorption during this surgery also, operative time, hospital stay.

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