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Research Article

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The Impact of Pelvic Inflammatory Disease on Infertility Outcomes

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Abstract

Background*: The pelvic inflammatory disease (PID) is defined as chronic inflammation and infection of the uterine lining (endometritis) and fallopian tubes (salpingitis) which affected frequently reproductive age women and results on chronic pelvic pain, recurrent PID and infertility (tubal factor).*

Aim of The Study: *This study aimed to determine the impact of pelvic inflammatory disease on infertility outcomes.*
Methods and Materials: This study was retrospective case series study which conducted on multicenter private sectors (Balsam clinic, Rosemary clinic and Alnajah clinic) on Tripoli, Libya over duration from January 2015 to February 2024. Out of 500 infertile Libyan women who diagnosed by pelvic inflammatory disease which selected from medical files were included. The relevant data were extracted through standardized questionnaire by investigator during time period. The data was encoded and analyzed via SPSS program version 24.

Results: *The mean age was 27.52 ± 6.202 SD, the majority of patients had primary infertility accounted for 86.8% (434) while just 13.2% (66) of them had secondary infertility with the mean duration of infertility was 4.52 ± 2.112 SD. Based on clinical manifestations at presentation, 85.8% (429) had associated urinary symptoms, 84.8% (424) had abnormal uterine bleeding, 81.8% (409) had chronic pelvic pain, 76.2% (381) had pelvic heaviness, 53.2% (266) had vaginal discharge, 13.4% (67) had dysmenorrhea and 6.6% (33) had dyspareunia. On hysterosalpingogram pictures evaluation had revealed right tube obstructed on 13.2% (66), left tube obstructed on 18.6% (93) and bilateral tubal obstruction on 14.2% (71). 48.2% (241) had moderate hydrosalpinx followed by 38.6% (193) had mild hydrosalpinx and 13.2% (66) had severe hydrosalpinx. By hysteroscopic evaluation, 50.8% (254) of patients had chronic endometritis. The mean frequency of Tubal patency test (TPT) or intraoperative hydrocupration procedure sessions was 2.46 ± 0.813 SD. Based on management outcomes, 67.0% (335) of patients had successfully managed by medical regime only while 33.0% (165) were required additional hysteroscopy intervention. And all patients had successfully became pregnant followed the management protocol.*

Conclusion: *Although, the pelvic inflammatory disease among infertile women can be complex but effective strict management of medical protocols along with intraoperative hydrocupration procedure sessions had pronounced outcome and increase pregnancy rate even among complicated severe hydrosalpinx.*

Keywords: Pelvic Inflammatory Disease, PID, Infertility, Hysterosalpingogram, Hysteroscopy, Libya.

List of Abbreviations

HSG = Hysterosalpingogram
PID = Pelvic inflammatory disease
SPSS = Statistical Package for the Social Sciences TPT = Tubal patency test

1. Introduction

The pelvic inflammatory disease (PID) is defined as chronic inflammation and infection of the uterine lining (endometritis) and fallopian tubes (salpingitis) which affected frequently reproductive age women and results on chronic pelvic pain, recurrent PID and infertility (tubal factor) [1]. The diagnosis of PID is considered mainly clinically with Varity clinical manifestations which ranged from asymptomatic to endometritis, Para metritis, tube-ovarian abscess, salpingitis, oophores, pelvic peritonitis, perihepatitis (Fitz–Hugh–Curtis syndrome) and ovarian carcinogenesis which required prompt management by antibiotics regimes to eradicate the primary pathogens included Neisseria gonorrhoeae and

Chlamydia trachomatis. Certain complications related to PID required prompt management to prevent them included short term complications such as tubo-ovarian or pelvic abscess and long-term complications such as chronic pelvic pain, ectopic pregnancy (50%) and infertility (30%) with high proportion of tubal factor [2-7]. But the infertility due to STDs cause as PID is considered preventable. Therefore, implanting supportive programs to early detection and prompt management of this event are crucial to improve good outcomes [8]. On Libya, Limited data regarding the rate of pelvic inflammatory disease among infertile women. So, this study directed to infertile Libyan women who had pelvic inflammatory disease to determine its impact and management outcomes following standardized therapy of antibiotics as well as intraoperative hydrocupration procedure sessions and hysteroscopy for certain cases.

2. Aim of The Study: This study aimed to determine the impact of pelvic inflammatory disease on infertility outcomes.

3. Methods and Materials: This study was retrospective case series study which conducted on multicenter private sectors (Balsam clinic, Rosemary clinic and Alnajah clinic) on Tripoli, Libya over duration from January 2015 to February 2024.

Study Population: Out of 500 infertile Libyan women who diagnosed by pelvic inflammatory disease which selected from medical files were included. The relevant data were extracted through standardized questionnaire by investigator during time period.

3.1 Inclusion Criteria

• Infertile Libyan women who diagnosed by pelvic inflammatory disease.
• Patients who received standardized medical treatment protocol strictly with documented follow up management.
• Normal semen analysis for their partners.

3.2 Exclusion Criteria

-Non-Libyan.
-Missed data on medical records.
-Patients not received medical treatment protocol.
-Abnormal semen analysis on their partners.

3.3 Standardized Medical Treatment Protocol: All cases had received standardized antibiotics therapy included Penicillin 800,000 IU IM twice for five days, Metronidazole 500 mg IV twice for five days then orally twice for ten days, ciprofloxacin one gram orally once for 15 days, Doxycycline 200 mg orally once for 16 days and Clindamycin 300 mg orally three times per day for 15 days as well as folic acid and multivitamins once daily had prescribed.

Study procedure: All patients undergone Tubal patency test (TPT) or intraoperative hydrotubation procedure sessions according to patient clinical status by same highly skilled specialized infertility management physician. The intraoperative hydrotubation procedure performed under general anesthesia via insertion of intrauterine silicon urinary catheter for pelvic washing and fluid removal by used ringer lactate 50 ml then introducing hydrocortisone 100 mg, gentamicin 80 mg, alpha chymotrypsin and hyoscine-N-Butylbromide along with intrauterine plasma given. All patients were underwent serial sessions of management as the follows first session will counseling the couples regarding their treatment discuss path, second session will arrange to initiate the management protocol for both couples, then after two weeks arrange both couple for further investigations such as hysterosalpingogram picture and semen analysis to assess improvement from pyospermia and if not improved will add additional two weeks course of antibiotics till improved along with initiate antioxidant and multivitamins for partners, then the couples will give appointment session after three months with perform intraoperative hydrotubation procedure monthly for women till became asterile along with their previous supportive management.

Data analysis: The data was encoded and analyzed via SPSS program version 24. Descriptive statistics included frequency and percentage were summarized on graphical and tubular manner. And the inferential statistics included Chi square test was used. The P-value of less than 0.05 was considered statistically significant.

4. Results

This study had included 500 infertile Libyan women diagnosed by pelvic inflammatory disease who attended multicenter private sectors on Tripoli, Libya over duration from January 2015 to February 2024. The mean age was 27.52 ± 6.202 SD with the minimum age was 19 years while the maximum age was 48 years. (Table 1)

Variables (n = 500)	Age frequency
Mean	27.52
Median	26.00
Mode	20
Std. Deviation	6.202
Minimum	19
Maximum	48

Table 1: Age frequency, Tripoli, Libya, 2015 – 2024

The majority of patients had primary infertility accounted for 86.8% (434) while just 13.2% (66) of them had secondary infertility with the mean duration of infertility was 4.52 ± 2.112 SD. (Figure 1)

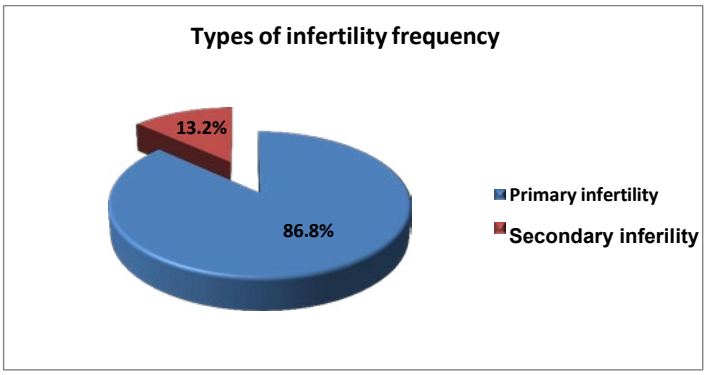

Figure 1: Types of infertility frequency, Tripoli, Libya, 2015 – 2024.

Based on clinical manifestations at presentation, 85.8% (429) had associated urinary symptoms, 84.8% (424) had abnormal uterine bleeding, 81.8% (409) had chronic pelvic pain, 76.2% (381) had pelvic heaviness, 53.2% (266) had vaginal discharge, 13.4% (67) had dysmenorrhea and 6.6% (33) had dyspareunia. (Table 2)

Variables (n = 500)	Yes	No
Associated urinary symptoms	85.8% (429)	14.2% (71)
Abnormal uterine bleeding	84.8% (424)	15.2% (76)
Chronic pelvic pain	81.8% (409)	18.2% (91)
Pelvic heaviness	76.2% (381)	23.8% (119)
Vaginal discharge	53.2% (266)	46.8% (234)
Dysmenorrhea	13.4% (67)	86.6% (433)
Dyspareunia	6.6% (33)	93.4% (467)

Table 2: Clinical manifestations frequency, Tripoli, Libya, 2015 – 2024

All patients had reported variable degree of fluid on pouch of Douglas during transvaginal ultrasound examination. On hysterosalpingogram pictures evaluation had revealed right tube obstructed on 13.2% (66), left tube obstructed on 18.6% (93) and bilateral tubal obstruction on 14.2% (71). (Table 3)

Variables (n = 500)	Patent	Obstructed
Right tube	86.8% (434)	13.2% (66)
Left tube	81.4% (407)	18.6% (93)
Both tubes	85.8% (429)	14.2% (71)

Table 3: Hysteronsalpingiogram pictures frequency, Tripoli, Libya, 2015 – 2024.

Based on hydrosaplinx severity of hysteronsalpingiogram pictures, 48.2% (241) had moderate hydrosalpinx followed by 38.6% (193) had mild hydrosalpinx and 13.2% (66) had severe hydrosalpinx. (Figure 2)

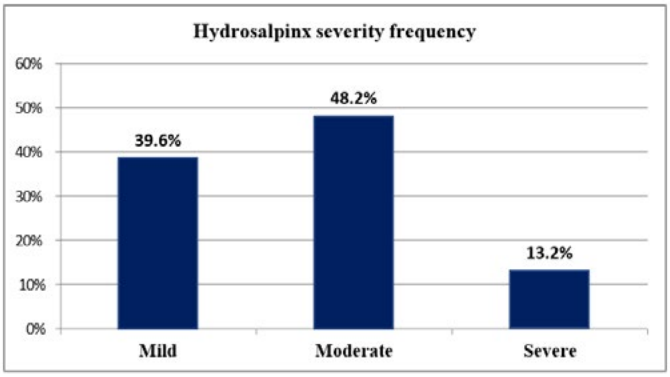

Figure 2: Hydrosalpinx severity of hysteronsalpingiogram pictures frequency, Tripoli, Libya, 2015 – 2024

By hysteroscopic evaluation, 50.8% (254) of patients had chronic endometritis. The mean frequency of Tubal patency test (TPT) or intraoperative hydrotubation procedure sessions was 2.46 ± 0.813 SD with the minimum TPT was one session while the maximum TPT was five sessions. Based on management outcomes, 67.0% (335) of patients had successfully managed by medical regime only while 33.0% (165) were required additional hysteroscopy intervention. (Figure 3) And all patients had successfully became pregnant followed the management protocol.

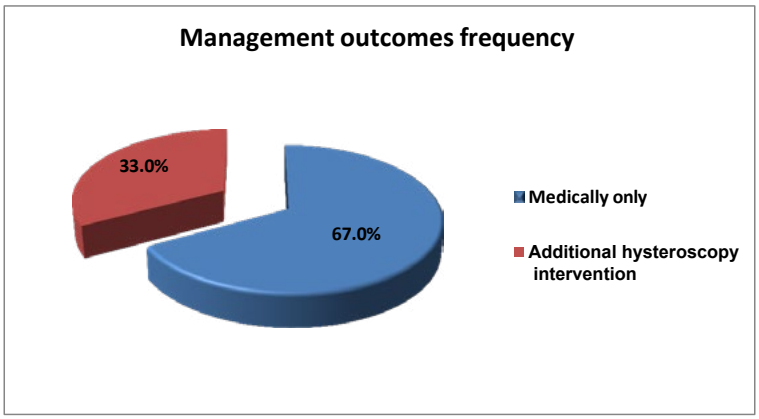

Figure 3: Management outcomes frequency, Tripoli, Libya, 2015 – 2024.

5. Discussion

The pelvic inflammatory disease had reported to responsible for quarter of infertility particularly tubal factor which explained by chronic pathological tubal inflammation, fibrosis that lead to subsequent scarring [9-10]. On the current study, we demonstrated the effect and management outcomes of pelvic inflammatory disease among infertile Libyan women. The standardized medical protocol along with intraoperative hydrocupration procedure sessions in the present study had found to be effectively manage the infertile cases and lead to successful pregnancy outcome. This result supported by several studies which revealed that the treatment regime of PID by metronidazole, ceftriaxone and doxycycline had high eradication rate with good outcomes followed one-month therapy [11]. On the present study, half of patients (50.8%) reported had chronic endometritis as result of delayed diagnosis and management. This evidence had explained by Cuccinelli E et al study which recognized that the chronic endometritis is frequently related to unexplained infertility and the early diagnosis as well as adequate management can eventually improve pregnancy rates [12]. And the hysteroscopy is considered as gold standard procedure in the assessment of the uterine cavity in patients particularly in intrauterine conditions such as infertility, recurrent pregnancy loss, myomas, abnormal uterine bleeding. (13) The limitation of the study was retrospective while the strength of the study was multicenter over long time duration.

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Conclusion

Although, the pelvic inflammatory disease among infertile women can be complex but effective strict management of medical protocols along with intraoperative hydrocupration procedure sessions had pronounced outcome and increase pregnancy rate even among complicated severe hydrosalpinx.

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