

To Determine the Frequency of Endometriosis in Sub-Fertile Women Undergoing Laparoscopy

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Abstract

Objective: The objective of the study was to determine the Frequency of Endometriosis in Sub-fertile women undergoing Laparoscopy.

Methods: The cross-sectional study was performed in Obstetrics and Gynaecology Department Civil Hospital Karachi, from 1 January 2016 to 30 June 2016. Subfertility is an important issue. This study examined the endometriosis as a cause of subfertility. Total 96 women with primary and secondary subfertility, irrespective of age and parity undergoing laparoscopy were selected in this study. Women with history of tuberculosis, acute pelvic inflammatory disease and history of previous pelvic surgery were excluded. Participants who were fulfilling the inclusion and exclusion criteria were selected from outpatient department. Detailed history was taken and previous record reviewed. Informed consent was obtained. General physical examination, per abdominal and per vaginal examinations were performed by researcher. Prior to admission baseline investigations were done. For laparoscopy, patient was admitted a day before surgery. Laparoscopy was performed and intra operative findings were recorded in a self-designed questionnaire. The calculated data was analyzed by using SPSS version 16.

Results: Total 96 women with primary and secondary subfertility were selected in this study. Most of the women were below 30 years of age. The average age of the women was 27.44 ± 3.69 years similarly duration of marriage was 6.26 ± 3.06 years. Primary subfertility was observed in 67(69.79%) women and 29(30.21%) were with secondary subfertility. Frequency of endometriosis in sub-fertile women undergoing laparoscopy was found in 32(33.33%) women.

Conclusion: Our study concluded that endometriosis with infertility is not an uncommon disease in women. We found a reasonable frequency of endometriosis in sub-fertile women undergoing laparoscopy.

Keywords: Endometriosis, Laparoscopy, Subfertility.

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Introduction

Endometriosis is a condition, which is debilitating. The prevalence of endometriosis in women in the reproductive years is estimated to be 5-10%¹. "Endometriosis is defined as a presence of endometrial glands and stroma outside the uterine cavity". Ovaries, fallopian tubes and pelvis are common sites of endometriosis. Endometriosis is not

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only limited to pelvis but it can spread to other sites such as peritoneum, bladder, ureters, intestines and lungs. This endometrium like tissue is not only similar morphologically but it also reacts to monthly cyclical hormonal changes². The true rate in the general population is unknown because the surgery has to be performed to inspect the pelvis³. The frequency of endometriosis in sub-fertile women varies between 20-50% because it depends on the characteristics of the patient and the tools used for the diagnosis. Various studies have explained that 25-50% of sub-fertile women have endometriosis and 30-50% of women with endometriosis are subfertile⁴.

The exact pathophysiology of endometriosis is not known. Several theories have been proposed to explain the etiology of endometriosis such as retrograde menstruation theory, metaplasia theory, lymphatic and vascular spreading and hereditary^{2,4}. During laparoscopy peritoneum, fallopian tubes, ovaries and pouch of Douglas are inspected for the presence of endometriosis and adhesions and the disease is classified into minimal, mild, moderate and severe by using American Fertility Society classification system. This classification system gives an idea about the chances of conception. Women with minimal or mild disease have a higher chance of conception as compared to those who have a moderate or severe disease^{2,4}.

There are various modalities available for the diagnosis of endometriosis such as transvaginal ultrasound and magnetic resonance imaging but these are less efficient due to lack of adequate resolution in visualizing superficial lesions². Laparoscopy is considered as the gold standard not only for the definitive diagnosis but also for the treatment of endometriosis⁵. Large scale research work has been done despite of this it is difficult to reach any consensus and the exact mechanism to explain the association between subfertility and endometriosis is still not known⁶. Distorted anatomy of pelvis due to adhesions, altered peritoneal function, fallopian tubes and ovarian dysfunction, altered hormonal and cell mediated function are various proposed mechanisms involve in the occurrence of subfertility in endometriosis⁷.

The study conducted in Aga Khan University Hospital from January 1999 to December 2005 on 796 patients concluded that 16.8% sub-fertile patient had endometriosis. This study was retrospective study⁸.

Some women with endometriosis have no symptoms whereas other has symptoms such as chronic pelvic pain, painful menstruation, painful intercourse, adnexal mass and subfertility⁹. Clinically it is difficult to diagnosed endometriosis and exact diagnosis can only be made on direct visualization of pelvis by laparoscopy.

As the literature has suggested, endometriosis is a common disease in sub-fertile patient. The study in Aga Khan University hospital was conducted in 2005 lastly. The same study has not been conducted in last 10 years. Therefore, the aim of this study is to calculate the current magnitude of endometriosis in sub-fertile women undergoing laparoscopy, to know the occurrence of this condition in our population and recommend that sub-fertile women will investigate for endometriosis.

Patients and Methods

A cross sectional study was conducted in the department of Obstetrics and Gynaecology Civil hospital Karachi from 1 January to 30 June 2016. All sub-fertile women undergoing laparoscopy were included in the study, Women with history of tuberculosis, acute pelvic inflammatory disease and history of previous pelvic surgery were excluded. Sample size calculated by using open EPI calculator taking prevalence of endometriosis in sub-fertile women was 16.8% with 95% confidence interval and margin of error 7.5% sample size calculated 96. Sample collected by non-probability consecutive sampling technique. Participants who were fulfilling the inclusion and exclusion criteria were selected from outpatient department. Detailed history was taken and previous record reviewed. Informed consent was obtained. General physical examination, per abdominal and per vaginal-examinations were performed by researcher. Prior to admission baseline investigations were done. For laparoscopy, patient was admitted a day before surgery. Laparoscopy was performed. Intra operative findings were recorded in a self-designed questionnaire.

The calculated data was analyzed by using SPSS version 16. Mean and standard deviation was computed for quantitative variables like age and duration of marriage and frequency and percentage of endometriosis was calculated for parity and primary and secondary sub fertility. Effect modifiers like age, parity, duration of marriage, primary sub fertility and secondary subfertility was controlled through

stratification. Chi Square test was applied using 'p 0.05' as significant.

Results

Total 96 women with primary and secondary subfertility were selected in this study. Most of the women were below 30 years of age. The average age of the women was 27.44 ± 3.69 years similarly duration of marriage was 6.26 ± 3.06 years. Primary subfertility was observed in 67(69.79%) women and 29(30.21%) were secondary subfertility.

Frequency of endometriosis in sub-fertile women undergoing laparoscopy was found in 32(33.33%) women. Stratification of endometriosis with respect to age, parity, duration of marriage, primary and secondary subfertility are shown in Table I, II and III. Rate of endometriosis was not significant among different age groups. Similarly, effect of duration of marriage, parity and primary and secondary of sub-fertile was not significant on rate of endometriosis.

Table 1. Frequency of Endometriosis with respect to Age, Duration of marriage and Parity(n=96)

Variable	n= 96	Endometriosis YES (%)	NO (%)	Mean	P-Value
Age					
< 25 years	32	10 (31.3)	22 (68.8)	27.44 ± 3.69	0.95
26 to 30 years	49	17 (34.7)	32 (65.3)		
31 to 35 years	15	05 (33.3)	10 (66.7)		
Duration of Marriage					
< 5 years	49	17 (34.7)	32 (65.3)	6.26 ± 3.06	0.807
6 to 10 years	34	10 (29.4)	24 (70.6)		
> 10 years	13	5 (38.5)	8 (61.5)		
Parity					
Nulliparous	67	22 (32.8)	45 (67.2)	-----	0.87
Para 1 to 2	29	10 (34.5)	19 (65.5)		

Table 2. Frequency of Endometriosis with respect to Primary Subfertility (n=96)

Primary Subfertility	Endometriosis		P-Value
	Yes (%)	No (%)	
Yes(n= 67)	22(32.8)	45 (67.2)	0.87
No(n= 29)	10(34.5)	19 (65.5)	
Total			96

Table 3. Frequency of Endometriosis with respect to Secondary Subfertility(n=96)

Secondary Subfertility	Endometriosis		P-Value
	Yes (%)	No (%)	
Yes(n=29)	10(34.5)	19(65.5)	0.87
No(n=67)	22(32.8)	45 (67.2)	
Total			96

Discussion

"Subfertility is defined as failure to conceive spontaneously following regular unprotected intercourse for 12 months"¹⁰. The incidence is almost 10-15%. Subfertility remains to be a common social, psychological and a health problem. It is neither life threatening nor a cause of ill health, the socio-cultural stigma related to subfertility not only increase personal suffering but it also leads to family breakdown¹¹. Duration of subfertility is very important regarding the initiation of investigations and treatment. There are many reasons for sub fertility or infertility but association of subfertility with endometriosis is a very depressive, frustrating and troubling symptom not only for female patient also for male partner due to uncertainty in the treatment options available for the disease^{12,13}. Pathology of endometriosis is complex and enigmatic it is like a puzzle whose complex pieces remain largely disengaged regardless of some decades of investigation. Although infertility and endometriosis are clearly connected but correlation between the two is still remain obscure^{2,4}. In this study we recruited 96 women with primary and secondary subfertility for the determination of frequency of endometriosis in sub-fertile women undergoing Laparoscopy.

Age is an important factor for fertility outcome. With growing age, the chances of conception decrease as the number of follicles in the ovaries decrease and the quality of oocytes also affected¹⁴. In the present study majority of the women were belonged to the less than 30 years of age, the average age of the women was 27.44 ± 3.69 years there is corresponding rise in mean age at which

women present with infertility. In the present study the mean age at presentation was 27.44 ± 3.69 years, while the study conducted by Sajida P et al. reported earlier mean age was 28.4 years¹⁵. Another study conducted by Mishra V Vineet et al. showed mean age of the participants was 29 years⁴. In our study, Primary subfertility was observed in 69.79% women and 30.21% were secondary subfertility. The study conducted by Nousheen aziz et al¹⁶ reported that out of 50 patients, 32 patients (64%) presented with primary infertility and 18 patients (36%) presented with secondary infertility. Farquhar C et al. reported Primary subfertility in 61% patients while 39% had secondary subfertility¹⁷.

There is a very high association between endometriosis and subfertility. The true prevalence of endometriosis is difficult to determine as the disease can also present in asymptomatic patient. In general population prevalence of endometriosis is estimated up to 10% and previous studies suggested that frequency of endometriosis in fertile women is 0.5-5% and 25-40% in infertile women¹⁸. Tsuzi et al reported worldwide prevalence of endometriosis is approximately 63%¹⁹. The study conducted by Ghazala M et al.²⁰ found incidence of endometriosis in sub-fertile patient was 24% while in present study the frequency of endometriosis in sub-fertile women undergoing laparoscopy was found in 32(33.33%) women. In a local study Rabia Rehman et al.²¹ reported endometriosis was found in 6 (6%) patients of their study while Nazir et al.²² reported frequency of endometriosis was 15%. The study conducted by Nousheen Aziz et al¹⁶ reported frequency of endometriosis in case of primary subfertility was 12.5% and 11.1% in case of secondary subfertility. Other studies found incidence of endometriosis in sub fertile or infertile population is 5-50%, and it has been suggested that risk of endometriosis is 6-8 times higher in sub fertile women as compared to fertile women²³. A review by D'Hooghe et al. also reported that the prevalence of endometriosis is significantly higher in infertile than fertile women and fecundity rate in sub

fertile women with endometriosis is lower as compared to women with unexplained infertility²⁴.

The main limitations of the present study is it was a single center study and conducted with small sample size therefore the results might not be generalized to larger populations. The results from this study provide important information for clinicians to work at grass root level while dealing with infertile couples and recommend that sub-fertile women should be investigated for endometriosis.

Conclusion

Our study concluded that endometriosis with infertility is not an uncommon disease in women. We found a reasonable frequency of endometriosis in sub-fertile women undergoing laparoscopy.

Conflict of Interest

Authors have no conflict of interest and no grant/funding from any organization.

References

1. Slabuszewska-Jozwiak A, Ciebiera M, Baran A, Jakiel G. Effectiveness of laparoscopic surgery in treating infertility related to endometriosis. *Ann Agric Environ Med.* 2015;22:329-31. [DOI: 10.5604/12321966.1152089]
2. Jin X, Beguerie JR. Laparoscopic surgery for subfertility related to endometriosis: a meta-analysis. *Taiwanese Journal of Obstetrics and Gynecology.* 2014 Sep 1;53:303-8. [DOI: 10.1016/j.tjog.2013.02.004]
3. Janssen EB, Rijkers AC, Hoppenbrouwers K, Meuleman C, d'Hooghe TM. Prevalence of endometriosis diagnosed by laparoscopy in adolescents with dysmenorrhea or chronic pelvic pain: a systematic review. *Human reproduction update.* 2013 Sep 1;19:570-82. [DOI: 10.1093/humupd/dmt016]
4. Mishra VV, Gaddagi RA, Aggarwal R, Choudhary S, Sharma U, Patel U. Prevalence; characteristics and management of endometriosis amongst infertile women: a one year retrospective study. *Journal of clinical and diagnostic research: JCDR.* 2015 Jun;9:QC01. [DOI: 10.7860/JCDR/2015/13687.6125]
5. Dunselman GA, Vermeulen N, Becker C, Calhaz-Jorge C, D'Hooghe T, De Bie B, Heikinheimo O, Horne AW, Kiesel L, Nap A, Prentice A. ESHRE

- guideline: management of women with endometriosis. *Human reproduction*. 2014 Mar 1;29:400-12. [DOI: 10.1093/humrep/det457]
6. de Ziegler D, Borghese B, Chapron C. Endometriosis and infertility: pathophysiology and management. *Lancet*. 2010;376:730-8. [DOI: 10.1016/S0140-6736(10)60490-4]
 7. Kennedy S, Koninckx P. Endometriosis. In: Edmonds DK, editor. *Dewhurst's textbook of obstetrics and gynaecology* [Online]. London: A John Wiley and Son; 2012. p. 615-24. Available from: <https://onlinelibrary.wiley.com/doi/abs/10.1002/9781119211457.ch51>. Accessed on: 20th -September-2021.
 8. Khawaja UJ, Khawaja AA, Gowani SA, Shoukat S, Ejaz S, Ali FN, et al. Frequency of endometriosis among infertile women and association of clinical signs and symptoms with the laparoscopic staging of endometriosis [Online]. *J Pak Med Assoc*. 2009 Jan;59:30-4. Available from: <https://pubmed.ncbi.nlm.nih.gov/19213374/> Accessed on: 20th - September-2021.
 9. Schragger S, Falleroni J, Edgoose J. Evaluation and treatment of endometriosis [Online]. *Am Fam physician*. Jan 15;87:107-13. Available from: <https://pubmed.ncbi.nlm.nih.gov/23317074/> Accessed on: 20th - September-2021.
 10. Macer ML, Taylor HS. Endometriosis and infertility: a review of the pathogenesis and treatment of endometriosis-associated infertility. *ObstetGynecolClin North Am*. 2012;39:535. [DOI: 10.1016/j.ogc.2012.10.002]
 11. Mascarenhas MN, Flaxman SR, Boerma T, Vanderpoel S, Stevens GA. National, regional, and global trends in infertility prevalence since 1990: a systematic analysis of 277 health surveys. *PLoS medicine*. 2012 Dec 18;9:e1001356. [DOI: 10.1371/journal.pmed.1001356]
 12. Cui W. Mother or nothing: the agony of infertility. *World Health Organization. Bulletin of the World Health Organization*. 2010 Dec 1;88:881. [DOI: 10.1097/MD.00000000000019167]
 13. Chachamovich JR, Chachamovich E, Ezer H, Fleck MP, Knauth D, Passos EP. Investigating quality of life and health-related quality of life in infertility: a systematic review. *Journal of Psychosomatic Obstetrics & Gynecology*. 2010 Jun 1;31:101-10.[DOI: 10.3109/0167482X.2010.481337]
 14. Farquhar C. Endometriosis. *BMJ*. 2007;334:249. [DOI: 10.1136/bmj.39073.736829.BE]
 15. Parveen S, Khanam M. Role of combined diagnostic laparoscopy and simultaneous diagnostic hysteroscopy for evaluation of female subfertility factors [Online]. *J Surg Pak (International)*. 2010 Jan;15:44-7. Available from: [http://old.jsp.org.pk/Issues/JSP%2015\(1\)%20Jan%20March%202010/Sajida%20Parveen%20OA.pdf](http://old.jsp.org.pk/Issues/JSP%2015(1)%20Jan%20March%202010/Sajida%20Parveen%20OA.pdf) Accessed on; 20th -September-2021.
 16. Aziz N. Laparoscopic evaluation of female factors in infertility. *J Coll Physicians Surg Pak*. 2010 Oct 1;20:649-52. [DOI: 10.2010/JCPSP.649652]
 17. Farquhar CM. Endometriosis. *Bmj*. 2000 May 27;32:1449-52. [DOI: 10.1136/bmj.320.7247.1449]
 18. Holoch KJ, Lessey BA. Endometriosis and infertility. *Clinical obstetrics and gynecology*. 2010 Jun 1;53:429-38 [DOI: 10.1097/GRF.0b013e3181db7d71]
 19. Tsuji I, Ami K, Miyazaki A, Hujinami N, Hoshiai H. Benefit of diagnostic laparoscopy for patients with unexplained infertility and normal hysterosalpingography findings. *The Tohoku journal of experimental medicine*. 2009;219:39-42. [DOI: 10.1620/tjem.219.39]
 20. Mehmud G, Akhtar T, Sadia S. Endometriosis: frequency and correlation between symptomatology and disease stage. *Journal of the College of Physicians and Surgeons--pakistan: JCPSP*. 2007 Apr 1;17:199-202.
 21. RehmanR, Rao SI,Siqqiq S. Frequency of various laproscopic diagnostic findings in subfertile Women [Online]. *JSOGP*. 2011;1:227-31 Available from: <https://juniperpublishers.com/jgwh/pdf/JGWH.MS.ID.555643.pdf> Accessed on: 20th-September-2021.
 22. Naz T, Hassan L, Guleem, Nighat F, Sultan S. Laparoscopic evaluation in infertility. *J Coll Physicians Surg Pak*. 2009; 19:704-7.
 23. Rizk B, Turki R, Lotfy H, Ranganathan S, Zahed H, Freeman AR, Shilbayeh Z, Sassy M, Shalaby M, Malik R. Surgery for endometriosis-associated infertility: do we exaggerate the magnitude of effect?. *Facts, views & vision in ObGyn*. 2015;7:109.
 24. D'hooghe TM, Debrock S, Hill JA, Meuleman C. Endometriosis and subfertility: is the relationship resolved?. *Semin. Reprod. Med*.2003; 21: 243-54 [DOI: 10.1055/s-2003-41330]