International Journal of Reproduction, Contraception, Obstetrics and Gynecology
Bharwani H et al. Int J Reprod Contracept Obstet Gynecol. 2017 Jul;6(7):2983-2989
www.ijrcog.org

pISSN 2320-1770 | eISSN 2320-1789

DOI: http://dx.doi.org/10.18203/2320-1770.ijrcog20172921

Original Research Article

Comparing role of laparoscopy, ultrasound and clinical examination in pelvic pain

Hema Bharwani*, Meena Jain

Department of Obstetrics and Gynecology, JLNH and RC, Bhilai, Chattisgarh, India

Received: 25 March 2017
Accepted: 27 April 2017

***Correspondence:**
Dr. Hema Bharwani,
E-mail: bharwanihema@yahoo.com

ABSTRACT

Background: Pelvic pain is a frequent and poorly understood complaint in women of reproductive age group, which is one of the most perplexing problems faced by the gynaecologist. This study was conducted to detect the cause of pelvic pain and to correlate clinical diagnosis, ultrasound, and laparoscopic di-agnosis and formulate treatment modalities.

Methods: This study was conducted in the Department of Obstetrics and Gynecology, JLN Hospital and RC, Bhilai, Chattisgarh during the one year period from September 2014 to August 2015. 97 women belonging age 15 to 65 years with history of pelvic pain (acute / chronic) were admitted after excluding history of acute abdominal trauma, diagnosed gynaecological malignant disorder, severe cardiac/respiratory disease or signs of peritonitis. A detailed history was taken and clinical examination was done.

Results: The age group in the present study was between 15 to 65 years. Among them, 36% cases belonged to 20-30 years age group. Clinically the most common sign was abdominal tenderness (59.89%). Clinically 47 cases (48.45%) had abnormal findings, on ultrasonography 61 cases (62.88%) had abnormal findings as compared to laparoscopy which could detect 75 cases (77.32%) showing abnormality. Most common pelvic pathology was adhesions (17.52%) followed by PID (14.43%). None of the cases of adhesions, fimbrial cyst, pelvic congestion syndrome and appendicitis were diagnosed clinically or ultrasonographically, all cases were diagnosed on laparoscopy. The sensitivity and specificity of clinical examination is 54% and 49% as compared to laparoscopy respectively. The PPV and NPV of clinical examination is 24% and 78% respectively. The sensitivity and specificity of ultrasonography is 59% and 69% as compared to laparoscopy respectively. The PPV and NPV of Ultrasonography is 36% and 85% respectively. Appropriate surgical intervention like salphingooopherectomy, adhesiolysis, myomectomy, hysterectomy was carried out laparoscopically.

Conclusions: Laparoscopy eliminates the diagnostic error and corrects the wrong diagnosis. Laparoscopy is a more sensitive and superior method for evaluation of pelvic pain as compared to Ultrasonography. Laparoscope has definitive place in evaluating patients with pelvic pain and often a definitive procedure can be undertaken with the laparoscope without subjecting the patient to laparotomy.

Keywords: Clinical examination, Laparoscopy, Pelvic pain, Ultrasonography

INTRODUCTION

Relief of pain is one of the most urgent and pressing request that a patient can make of any physician. For a gynaecological patient, this pain tends to be located in lower abdomen, lower back and pelvis. Pelvic pain is intermittent or constant pain in the lower abdomen or pelvis, including the abdominal wall at or below the umbilicus, lumbosacral back, or the buttocks. Sometimes the pain is so severe that it impedes activities of daily

living or causes functional disability and needs intervention from medical side. Pain is a symptom that may or may not be associated with obvious organic findings. Furthermore, pain is subjective. In each case, the psychological and organic aspects may be extremely difficult to separate.

The clinical history and clinical examination are not sufficient and concluding for exact diagnosis of pelvic pain. With the introduction of sonography and with good resolution power of 7.5MHz transducer there is a definite place of ultrasonography for diagnosis of pelvic pain as it is non-invasive, without any complications. Conventionally, an ultrasound scan will report the presence or absence of structural abnormality, such as ovarian cysts or hydrosalpinx, endometrioma, pelvic inflammatory disease, fibroid.[1]

Since the late 1960s laparoscopy has been used as both a diagnostic and therapeutic modality in patients with pelvic pain. Laparoscopy is considered the gold standard diagnostic tool for evaluation of pelvic pain. Pelvic pain is responsible for upto 50% of laparoscopies in women.[2] Under experienced hands diagnostic laparoscopy for gynecologic indications is safe with conversion rate to open laparotomy is 0.12%.[3] The advantage of laparoscopy is that simultaneous treatment of evident cause can be undertaken at the same sitting. Laparoscopy for pelvic pain is an operation based on the see and fight principle.[4]

Laparoscopy eliminates empiric treatment of suspected disease by providing direct visualization of pelvic structures. The presence and extent of significant pathologic conditions such as endometriosis, pelvic infections and adhesions can be documented and also used for the purpose of therapy. Even the final treatment in the form of hysterectomy can be taken accordingly to age, symptoms and pathology of patient with prior counseling and consent.

Objectives of present study were to detect the cause of pelvic pain with history and clinical examination and use of ultrasound and laparoscope, to correlate clinical diagnosis, ultrasound, and laparoscopic diagnosis and to formulate the treatment and perform laparoscopic interventions accordingly simultaneously in same sitting after direct visualisation of the disease

METHODS

It was hospital based prospective study. Patients admitted to, Department of Obstetrics and Gynecology, for evaluation of pelvic pain during the 1 year study period from September 2014 to August 2015. Sample size was 97.

Cochran formula

$N = Z^2xp(1-p)/e^2$,

where N is sample in each group, p is population proportion, e is level of precision.

Using Z=1.96 at 95% confidence interval, p as 6.8% i.e. 0.068 (in accordance with previous studies) 5-9 and; e as 5% i.e. 0.05, N comes to 97.

Patients were admitted in Department of Obstetrics and Gynecology, J.L.N. Hospital and Research Centre, Bhilai who were willing for laparoscopy after satisfying the inclusion and exclusion criteria and were enrolled into the study

Inclusion criteria

- Patients with complaint of pelvic pain (acute/chronic).

Exclusion criteria

- History of abdominal trauma(acute);
- Diagnosed gynaecological malignant disorder;
- Severe cardiac/respiratory disease;
- Signs of peritonitis.

Patients were included in the study who satisfied the selection criteria. All 97 patients were admitted to the hospital and a detailed history taking and clinical examination was done (proforma enclosed). And the following investigations were done.

- Complete haemogram,
- Routine blood and urine investigations,
- Ultrasound

All findings were noted in printed study proforma. From all patients, an informed consent was taken about the procedure and detailed explanation about laparoscopy was given and the operative laparoscopic procedure if required for the relief of pain was done in the same sitting.

The diagnostic laparoscopy was done under general anesthesia with patient placed in Lyod Davis position with tredenlenburg tilt.[10-15] After inserting verres needle, the abdomen was insufflated with CO_2 gas followed by insertion of 10 mm trocar and 10 mm scope and inspection of entire abdominal cavity.[15] The findings were noted and correlated with clinical and ultrasonographic findings and appropriate intervention was carried out

Statistical analysis

After primary data collection, a master chart was prepared with the help of Microsoft excel sheet and data entered into it was analyzed according to the set objectives. Non-parametric (discrete) data was analyzed using chi-square test. Mean, standard deviation and

percentage was used for analysis of parametric (continuous) data. A p value of <0.05 was considered to be statistically significant.

Mean is obtained by dividing the sum of observed values by the number of observations (n).

$$\overline{X} = \frac{\sum X}{N}$$

$\bar{x}$ =Arithmetic average or mean; ∑x=Sum of all values in data set; N=Number of the values in the data set.

Standard deviation is a statistical measure of spread or variability. The standard deviation is the root mean square deviation of the values from their arithmetic mean.

$$s = \sqrt{\frac{\sum(x - \bar{x})^2}{n - 1}}$$

S=SD, Standard deviation, ∑=sum of, x=each value in the data set, n=n, number of values in the data set

Chi-square test

$$X^2 = \sum \frac{(O-E)^2}{E}$$

O=observed value, E=expected value

Table 1: Sensitivity and specificity.

Test score	Has the disease	Does not have the disease
Positive	True Positives (TP)	False Positives (FP)
Negative	False Negatives (TN)	True Negatives (TN)

Sensitivity: TP/TP + FN

Specificity: TN/TN + FP

Positive Predictive Value (PPV): TP/TP + FP

Negative Predictive Value (NPV): TN/TN + FN

RESULTS

The age group in the present study was between 15 to 65 years. Among them, 36% cases belonged to 20-30 years age group (Figure 1 and 2).

62.89% patients were parous whereas 28% were nulliparous who also were cases of infertility pre-senting with pelvic pain. 91.75% (89 patients) were married which consisted of nulliparous and multiparous patients (Figure 3). Maximum patients (72%) presented with complaint of acute pain, while the rest (28%) with chronic pain (Figure 4).

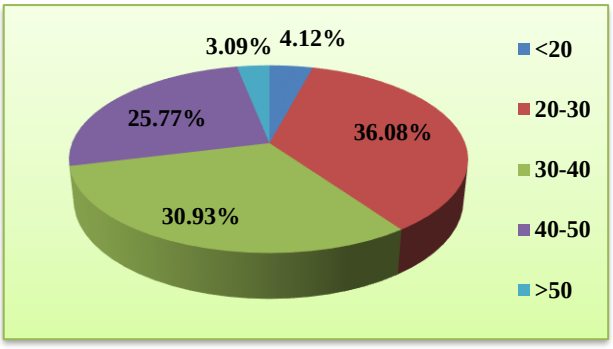

Figure 1: Age group wise distribution of pelvic pain.

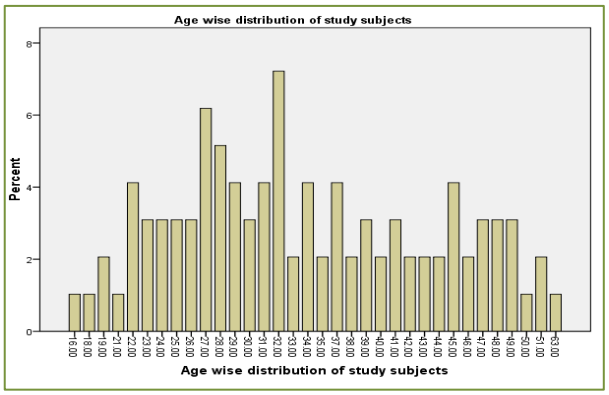

Figure 2: Age wise distribution of study subjects.

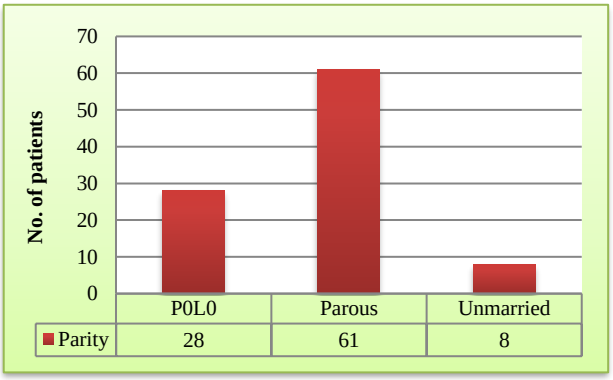

Figure 3: Parity wise distribution of pelvic pain.

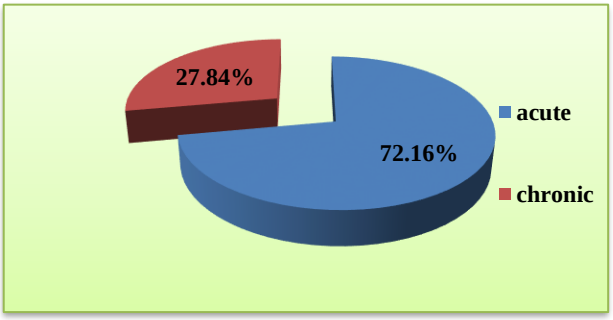

Figure 4: Duration of pain in patients with pelvic pain.

Table 2: Clinical findings in women with pelvic pain.

Signs	No. of patients	Percent
Abdominal tenderness	58	59.79
Restricted mobility	06	6.18
Adnexal tenderness	17	17.52
Adnexal mass / fullness	17	17.52
Bulky uterus	09	9.27
Discharge per vaginum	17	17.52
Cervical erosion	09	9.27
Dysmenorrhea	08	8.25
Dyspareunia	04	4.12
Normal / no significant findings	19	19.58

On clinical examination, maximum number of patients (59%) presented with abdominal tenderness, followed by adnexal tenderness (17%) and adnexal fullness (17%). Other findings were vaginal discharge, restricted mobility of uterus and cervical erosion.19 patients (19.58%) had absolutely normal clinical examination (Table 2).

Table 3: Diagnosis of pelvic pain by three methods.

Diagnosis	Method		
	Clinical diagnosis	Ultrasound	Laparoscopy
Normal	50	36	22
PID	28	19	14
Ovarian cyst	7	17	10
Fibroid	8	15	12
Ectopic	2	3	3
Endometriosis	2	6	9
Adhesions	-	-	17
Fimbrial cyst	-	-	2
Appendicitis	-	-	3
TB	-	1	3
PCS	-	-	2
Total	97	97	97

On laparoscopy, 22.68% patients had normal findings followed by 17.52% patients with adhesions, 14.43% with PID, 12.37% with fibroid, 10.31% with ovarian cyst, 9.28% with endometriosis, 3.09% each with ectopic, appendicitis, TB and 2.06% each with fimbrial cyst and pelvic congestion syndrome. On clinical examination 50 patients and on ultrasound 36 patients were found to be normal, whereas only 22 patients were found to have no abnormality on laparoscopy. This showed that clinically and ultrasonographically cases of pelvic pain were under diagnosed (Table 3).

Maximum cases of PID (28.86%) were diagnosed clinically, whereas maximum cases of ovarian cyst (17.52%) and fibroid (15.46%) were diagnosed by Ultrasonography. And laparoscopy proved to diagnose maximum cases of adhesions (17.52%). Out of 97 patients, who presented with pelvic pain 22 (22.68%) patients had no detectable pelvic pathology on laparoscopy, whereas prior ultrasonography done in all patients revealed normal scan in 36 (37.11%) patients.

Table 4: Correlation between clinical examination and laparoscopic findings.

Clinical examination	Laparoscopic findings		Total
	Normal	Abnormal	
Normal	12	38	50
Abnormal	10	37	47
Total	22	75	97

Hence, ultra-sonography under diagnosed 14 patients with pelvic pain who had some pathology on laparoscopy. On clinical examination, 50 (51.55%) patients were diagnosed as normal. Hence, clinical diagnosis also under diagnosed the 28 patients as normal who on laparoscopy had some pathology. Out of 50 patients having normal clinical examination, 12 patients had normal laparoscopic findings. Whereas 38 patients had abnormal laparoscopic findings. The sensitivity and specificity of clinical ex-amination is 54% and 49% as compared to laparoscopy respectively. The PPV and NPV of clinical examination is 24% and 78% respectively (Table 4).

Table 5: Correlation between ultrasonographic and laparoscopic findings.

USG findings	Laparoscopic findings		Total
	Normal	Abnormal	
Normal	13	23	36
Abnormal	9	52	61
Total	22	75	97

Out of 36 patients found to have normal ultrasound scans,13 patients had normal laparoscopic findings and 23 patients had pathology on laparoscopy. The sensitivity and specificity of ultrasonography is 59% and 69% as compared to laparoscopy respectively. The PPV and NPV of Ultrasonography is 36% and 85% respectively (Table 5).

Out of 28 patients diagnosed to be PID on clinical examination, 11 were actually having PID. Out of 19 cases diagnosed to be PID on Ultrasonography, 10 were the actual cases. Thus, PID was over diagnosed by clinical examination and Ultrasonography. Out of 2 cases diagnosed to be endometriosis on clinical examination, one was actual case. Out of 6 cases diagnosed to be endometriosis on ultrasonography, 4 were the actual cases of endometriosis and 2 cases were of adhesions.7 cases were diagnosed as ovarian cyst clinically. Out of them 4 cases were the actual cases. Out of 17 cases diagnosed as ovarian cyst on Ultrasonography, 9 cases were the actual ones. 8 cases were diagnosed as fibroid on clinical examination. Out of them, 7 were diagnosed correctly. One case was normal on laparoscopy. All cases (12 cases) of fibroid were diagnosed on Ultrasonography. Thus, clinical examination and Ultrasonography had

similar sensitivity in diagnosing fibroid. Clinically and ultrasonographically no cases of adhesions were diagnosed, all cases (17 cases) were diagnosed laparoscopically. Out of three cases of ectopic pregnancy, two cases were diagnosed clinically. All the three cases of ectopic pregnancy were diagnosed ultrasonographically. None of the case of fimbrial cyst, appendicitis and pelvic congestion syndrome was diagnosed by clinical ex-amination or on Ultrasonography. All cases were diagnosed laparoscopically. Thus, laparoscopy has high accuracy in diagnosing these conditions (Table 3).

Table 6: Laparoscopic diagnosis and treatment.

Diagnosis	No. of patients	Modality of treatment
Normal	22	Reassurance
PID	14	Lap salpingo-oophorectomy
		Lap salpingectomy
		Reassurance and antibiotics
		Drainage of pus and antibiotics
Ovarian cyst	10	Lap cystectomy
		Lap salpingo-oophorectomy
		Lap oopherectomy
		LAVH with BSO
		TLH with BSO
Fibroid	12	LAVH with BSO
		TLH with BSO
		Lap myomectomy
Ectopic	3	Lap salpingo-oophorectomy
		Lap salpingectomy
		Laparotomy followed by salpingo-oopherctomy
Endometriosis	9	Lap ablation of endometriotic lesions
		LAVH with BSO
		TAH
Adhesions	17	1.Lap adhesiolysis
		LAVH
Fimbrial cyst	2	Lap fimbrial cystectomy
Appendicitis	3	Lap appendicectomy
TB	3	Lap salpingooophorectomy
		AKT
Pelvic congestion syndrome	2	Lap ligation of ovarian vessels
Total	97	

Appropriate surgical intervention like salphingooopherectomy, adhesiolysis, myomectomy, hysterectomy was carried out laparoscopically (Table 6).

DISCUSSION

In the present study, maximum patients (36.08%) belonged to age group 20-30 years. Rawat et al[17] did a study and found maximum patients (37%) belonged to age group 25-30 years age group. Baloch S et al found 62.4% patients in age group 26-35 years.[18] The mean age in our study is 34.24 years, which is comparable to study conducted by Jyotsana et al[19] where mean age was 31.59 years. In present present study 91.75% patients are married and 28.87% are nulliparous. Baloch S et al in their study found 90.6% patients were married and 47.1% were nulliparous.[18] In present study, maximum patients (59.79%) presented with abdominal tenderness which was similar to that found by study of Rawat et al.[17]

The other clinical features were adnexal tenderness, adnexal mass and restricted mobility which were almost similar to that found by Rawat et al.[17] The incidence of adhesions, ovarian cyst, fibroid, endometriosis and pelvic congestion syndrome is correlating with that found in study done by Jyotsana L et al.[19] The incidence of patients with normal findings on laparoscopy was similar to that found in study conducted by Kamilya et al and Jyotsana L et al.[19,20]

In present study, maximum number of patients were diagnosed to have normal findings (22.68%) on laparoscopy followed by adhesions (17.58%) and PID (14.43%). Whereas in study conducted by Kamilya et al and Jyotsana L et al, the maximum number of patients diagnosed were of PID followed by normal findings.[19,20] This may be due to our study subjects belonged to higher economic class of society where the prevalence of infection was less.

The patients with normal and abnormal findings on laparoscopy, clinically and on ultrasonography was similar to that found in study of Kamilya et al (Table 7).[20]

In present study, out of 50 patients who had normal clinical findings, 38 patients (76%) had abnormal findings on laparoscopy. This was comparable to study done by Hebbar S et al who had 58% of patients with normal clinical findings diagnosed to have abnormal findings on laparoscopy.[21]

In present study, 63.88% patients with normal findings on Ultrasonography had abnormal laparoscopic findings which is comparable to that found by Gaitan H et al who found 70% of their patients with normal findings on Ultrasonography had abnormal laparoscopic findings.[22]

Sensitivity and Specificity

In present study, the sensitivity of clinical examination as compared to laparoscopy is 54% as compared to 76.84% given by Sharma and Meena.[23]

The sensitivity and specificity of ultrasonographic diagnosis as compared to laparoscopy is 59% and 69% respectively which is comparable with 61.05% and 73.33%, that given by Sharma and Meena.[23]

Table 7: Correlation between normal and abnormal findings.

	Laparoscopic findings		Clinical diagnosis		Ultrasonographic finding	
	Present study	Kamilya et al[17]	Present study	Kamilya et al[17]	Present study	Kamilya et al[17]
Normal	22.68%	26%	51.55%	47%	37.11%	39%
Abnormal	77.32%	74%	48.45%	53%	62.89%	61%

CONCLUSION

Pelvic Pain is a syndrome in which biological and psychosexual factors play role. Accuracy of clinical examination is limited by the presence of objective physical signs and symptoms. TVS approach can be of promising value in evaluation of pelvic pain but also needs training and experience for the techniques to increase sensitivity.

Laparoscopy is the excellent tool as diagnosis and treatment can be done at a same sitting. Thus, Pelvic Pain is best investigated laparoscopically before any treatment is planned. Laparoscope remains gold standard for patients presenting with pelvic pain.

ACKNOWLEDGMENTS

Authors would like to thank Dr. (Mrs) Meena Jain, Joint Director and Head of the Department of Obstetrics and Gynecology, J.L.N. Hospital and Research Centre, Bhilai, C.G., Shri B. D. Bharwani and Smt. Lata Bharwani for their support during study.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. RCOG Guideline No. 41 (2005). The initial management of chronic pelvic pain.
2. Roseff SJ, Murphy AA. Laparoscopy in the diagnosis and therapy of chronic pelvic pain. Clin Obstet Gynecol. 1990;33:137-44.
3. Ikechebelu JI. Experience with diagnostic laparoscopy for gynecological indications. Nigerian J Clin Prac. 2013;16(2):155-8.
4. Demir F, Ozcimen EE, Oral HB. The role of gynecological, urological, and psychiatric factors in chronic pelvic pain. Arch Gynecol Obstet. 2012;286(5):1215-20.
5. Zondervan KT, Yudkin PL, Vessey MP, Jenkinson CP, Dawes MG, Barlow DH et al. The community prevalence of chronic pelvic pain in women and associated illness behaviour. Br J Gen Pract. 2001;51:541-7.
6. Rulin MC, Davidson AR, Philliber SG, Graves WL, Cushman LF. Long-term effect of tubal sterilization on menstrual indices and pelvic pain. Obstet Gynecol. 1993;82:118-21.
7. Thongkrajai P, Pengsaa P, Lulitanond V. An epidemiological survey of female reproductive health status: gynecological complaints and sexually-transmitted diseases. Southeast Asian J Trop Med Public Health. 1999;30:287-95.
8. Zondervan KT, Yudkin PL, Vessey MP, Dawes MG, Barlow DH, Kennedy SH. Prevalence and incidence of chronic pelvic pain in primary care: Evidence from a national general practice database. Br J Obstet Gynaecol. 1999;106:1149-55.
9. Ahangari A. Prevalence of Chronic Pelvic Pain Among Women: An Updated Review. Pain Physician. 2014;17(2):E141-7.
10. Palanivelu C. Art of Laparoscopic Surgery. Textbook and Atlas. 1st ed, New Delhi, Jaypee Brothers Medical Publishers;2007:3-5,11-20.
11. Edmonson JM. History of instruments for gastrointestinal endoscopy. Gastrointest Endosc. 1991;37(2 suppl):S27-56.
12. Kelling G. HUJber Oesophagoscopy, gastroscopy and colonoscopy. Münch Med Wschr. 1902;1:21-24.
13. Kelling G. On the possibility of using cystoscopy in investigations of serous hungen. Munch Med Wochenschr. 1910;45:2358.
14. Gunning JE. The history of laparoscopy. J Report Med. 1974;12:222-6.
15. Veress J. New instrument for the treatment of breast or abdomen and phuemothorax treatment. Deutsche Med Wochenschr. 1938;64:1480-1.
16. Park K. Health Information and Basic Medical Statistics. In: K Park, editor. Textbook of preventive and social medicine. 21st ed. Jabalpur: M/s Banarsidas Bhanot;2005:786-792.
17. Rawat R, Seth S, Rawat R, Garg R, Shukla S, Vishwakarma S. Chronic pelvic pain in women: comparative study between ultra-sonography and laparoscopy as diagnostic tool. Int J Reprod Contracep Obstet Gynecol. 2014;3:998-1001.

18. Baloch S, Khaskheli MN, Malik AM. Diagnostic laparoscopic findings in chronic pelvic pain. 2013;23(3):190-3.
19. Lamba J, Kumar S, Gupta S, Verma N. Laparoscopic evaluation of chronic pelvic pain. JK Science. 2012;14 (2):74-76.
20. Kamilya G, Mukherji J, Gayen A. Different methods for evaluation of chronic pelvic pain. J Obstet Gynecol India. 2005;55:251-3.
21. Hebbar S, Chawla C. Role of laparoscopy in evaluation of chronic pelvic pain. J Min Access Surg. 2005;1:116-20.
22. Gaitan H, Angel E. Accuracy of five different diagnostic techniques in mild to moderate pelvic inflammatory disease. Infect Dis Obstet Gynecol. 2002;10(4):171-80.
23. Sharma S, Meena AK. Laparoscopic assessment of chronic pelvic pain in women – see and fight policy. CIB Tech J Surg. 2013;2:38-44.

Cite this article as: Bharwani H, Jain M. Comparing role of laparoscopy, ultrasound and clinical examination in pelvic pain. Int J Reprod Contracept Obstet Gynecol 2017;6:2983-9.