International Journal of Medical and Pharmaceutical Research

Online ISSN-2958-3683 | Print ISSN-2958-3675
Frequency: Bi-Monthly
Available online on: https://ijmpr.in/

Original Article

Point-of-Care Ultrasound (POCUS) in Gynecology: A Prospective Observational Study with Clinical Implications

Dr Dipu Singh[1], Dr Priyanka Singh[2], Dr Dushyant Kumar Varshney[3], Dr Kuldeep Singh[4]

[1]Assistant professor, Department of Radiodiagnosis, Career institute of Medical Sciences (CIMS), Lucknow
[2]Assistant professor, Department of obstetrics & Gynaecology, Career institute of Medical Sciences (CIMS), Lucknow
[3]Associate Professor, Department of Radiodiagnosis, BS Kushwah Institute of Medical Sciences
[4]Assistant Professor, Department of Radiodiagnosis, BS Kushwah Institute of Medical Sciences

OPEN ACCESS

Corresponding Author:

Dr Dushyant Kumar Varshney
Associate Professor, Department of Radiodiagnosis, BS Kushwah Institute of Medical Sciences

Received: 22-03-2026
Accepted: 03-05-2026
Available online: 11-05-2026

ABSTRACT

Background: Point-of-care ultrasound (POCUS) is increasingly used as a bedside diagnostic modality, allowing real-time clinical decision-making. Its role in gynecology remains underexplored in structured clinical research.
Objective: To evaluate the diagnostic utility, accuracy, and clinical impact of POCUS in gynecological practice.
Methods: A prospective observational study was conducted in our institution over a period of 6 months ranging from September 2025 to February 2026. Women presenting with gynecological complaints underwent POCUS followed by standard radiology-performed ultrasound (reference standard). Diagnostic concordance, time to diagnosis, and clinical outcomes were analyzed.
Results: Among 120 patients, POCUS demonstrated high sensitivity for detecting adnexal masses (88%), uterine fibroids (84%), and early intrauterine pregnancy (100%). Mean time to diagnosis was significantly reduced (12 ± 5 min vs 95 ± 30 min). Limitations were noted in detecting small intrauterine lesions (<2 cm).
Conclusion: POCUS is a rapid, reliable, and clinically impactful tool in gynecology, particularly in emergency and outpatient settings. Structured training is essential for optimal utilization.

Keywords*: POCUS, gynecology, bedside ultrasound, adnexal mass, ectopic pregnancy, handheld ultrasound, diagnostic accuracy.*

INTRODUCTION

Point of care ultrasonography (POCUS) is advanced diagnostic ultrasonography that is performed and interpreted by the attending physician as a bedside test [1]. POCUS has been widely used in many disciplines as a rapid diagnostic tool, especially in emergency medicine. POCUS has been used to aid the diagnosis of multiple medical conditions ranging from acute appendicitis, airway compromise, abdominal aortic aneurysm, traumatic injury assessment [2]. The relatively fast use has made it a potential option in situations where a formal radiological investigation may delay the diagnosis. Additionally, the ever-increasing demands of other diagnostic imaging and interventional radiological procedures have underscored the importance of non-radiologists physicians' contribution to radiological diagnosis through POCUS [3].

There are several advantages of incorporating POCUS in daily clinical practice, with the major one being integrating sonographic findings with history and clinical examination at the patient's bedside [4]. In addition, POCUS performed by the primary clinician reduces the need to involve a second clinician and avoids the need for patient transfer to a separate ultrasonography room. POCUS is a cost-effective approach that directly and indirectly saves healthcare expenses at both national and international scales [5].

Gynecology relies heavily on imaging for diagnosis of pelvic pathology. However, delays in formal ultrasound can impact outcomes, particularly in emergencies such as ectopic pregnancy or ovarian torsion. With the advent of portable and handheld ultrasound devices, POCUS offers an opportunity to bridge this gap.

This study aims to systematically evaluate the role of POCUS in gynecology with respect to diagnostic accuracy, efficiency, and clinical utility.

MATERIALS AND METHODS

Study Design and Setting

A prospective observational study conducted in the Department of Obstetrics and Gynecology in our institution.

Study Population

Inclusion critereia: Women aged 18–50 years presenting with pelvic pain, abnormal uterine bleeding, or early pregnancy complaints

Exclusion critereia: Hemodynamically unstable patients requiring immediate surgery and patients refusing consent were excluded from the research.

Procedure

All eligible participants underwent an initial clinical evaluation, including detailed history taking, physical examination, and relevant laboratory investigations such as serum β-hCG, where indicated.

Point-of-care ultrasound (POCUS) was subsequently performed by trained gynecologists using handheld ultrasound devices. A standardized scanning protocol was followed, including assessment of the uterus, adnexa, and the presence of free intraperitoneal fluid. Findings were documented immediately in a structured format. The POCUS operator was blinded to the results of the formal ultrasound examination.

All participants then underwent a formal ultrasound examination, including transabdominal and/or transvaginal imaging as clinically indicated. These examinations were performed by qualified radiologists in the radiology department, who were blinded to the POCUS findings.

The findings of POCUS were compared with those of the formal ultrasound, which was considered the reference standard. Diagnostic performance was assessed by classifying results as true positive, true negative, false positive, or false negative.

Outcome Measures

The primary outcome measure was the diagnostic accuracy of point-of-care ultrasound (POCUS), assessed in terms of sensitivity and specificity using formal ultrasound as the reference standard. Secondary outcome measures included the time to diagnosis and the impact of POCUS findings on clinical decision-making.

RESULTS

Demographic Profile

The mean age of the study population was 29.4 ± 7.2 years. The most common presenting complaint was pelvic pain, observed in 46% of participants, followed by abnormal vaginal bleeding in 32% of cases.

Diagnostic Accuracy

Condition	Sensitivity (%)	Specificity (%)
Early intrauterine pregnancy	100	100
Ectopic pregnancy	90	98
Uterine fibroids (>2 cm)	84	96
Adnexal masses (>3 cm)	88	95
Small intrauterine lesions	40	98

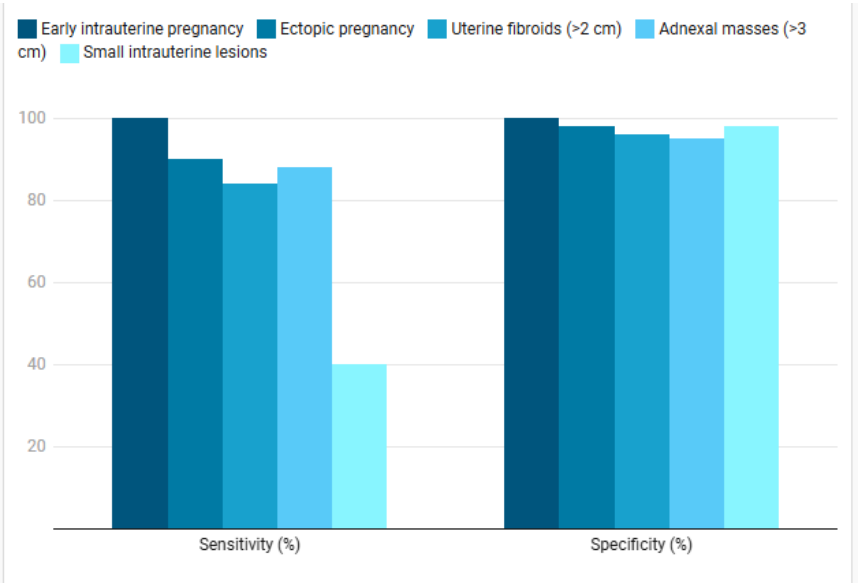

Figure: Grouped bar chart showing both sensitivity (%) and specificity (%) across several gynecological conditions
Comparable studies using handheld ultrasound devices have also demonstrated high specificity (up to 99.7%) and good agreement with conventional ultrasound for major gynecologic findings [6-10].

Time Efficiency
The mean time to diagnosis using point-of-care ultrasound (POCUS) was 12 minutes, compared with 95 minutes for formal ultrasound. This difference was statistically significant ($p < 0.001$), demonstrating a substantial reduction in time to diagnosis with POCUS.

Clinical Impact
POCUS findings led to changes in immediate clinical management in 38% of cases. Additionally, the use of POCUS reduced the need for urgent radiology referrals in hemodynamically stable patients and facilitated faster triaging in the emergency setting.

DISCUSSION
In our study, point-of-care ultrasound (POCUS) demonstrated strong diagnostic performance in identifying common gynecological conditions. Principal advantage of POCUS is the ability to provide rapid bedside assessment, which is particularly valuable in acute or emergency settings. Previous studies have similarly shown that POCUS can significantly reduce time to appropriate treatment and improve workflow efficiency [6,7,8,9].

POCUS is particularly useful for early pregnancy assessment, including evaluation of viability and detection of ectopic pregnancy. POCUS also aids in the evaluation of acute pelvic pain, the identification of fibroids and adnexal masses, and post-procedural or follow-up assessments. Previous study by *Seth et al* (2025) demonstrated sensitivity of 90% and specificity of 99.3% for diagnosing pelvic pathologies in acute abdomen[11]. Similar findings were also observed in our study.

The main advantages of POCUS include real-time imaging that can be integrated with clinical findings, portability, cost-effectiveness, and absence of radiation exposure. Additionally, POCUS has the potential to reduce diagnostic delays and streamline patient management.

Despite its benefits, POCUS is highly operator-dependent, and its sensitivity may be reduced for detecting small intrauterine lesions. In our study, the sensitivity of detection for small intrauterine lesions was 40%. The possible reason for low sensitivity was limited field of view compared to comprehensive formal ultrasound. Effective use of POCUS requires structured training and ongoing competency assessment. Variability in image acquisition and interpretation remains a significant challenge, highlighting the need for standardized training programs and competency frameworks (arXiv).

Future Directions
The integration of artificial intelligence (AI) into POCUS holds promise for enhancing image interpretation and reducing operator dependency. Expansion of handheld ultrasound use in primary care settings could facilitate earlier detection and triaging of gynecological conditions. Tele-POCUS may enable remote consultations, improving access to specialist care

in underserved areas. Furthermore, the development of standardized, gynecology-specific POCUS protocols is essential to ensure consistency, reliability, and wider adoption of this technology in clinical practice.

CONCLUSION

POCUS is a transformative tool in gynecology, enhancing bedside diagnostic capability and reducing delays in patient care. While it cannot replace comprehensive imaging, it serves as a powerful adjunct that improves clinical efficiency and outcomes. Wider adoption with proper training can significantly advance gynecologic practice, especially in resource-limited settings.

REFERENCES

1. Moore CL, Copel JA. Point-of-care ultrasonography. N Engl J Med. 2011 Feb 24;364(8):749-57. doi: 10.1056/NEJMra0909487. PMID: 21345104.
2. Wagner M, Shen-Wagner J, Zhang KX, Flynn T, Bergman K. Point-of-Care Ultrasound Applications in the Outpatient Clinic. South Med J. 2018 Jul;111(7):404-410. doi: 10.14423/SMJ.0000000000000835. PMID: 29978225.
3. Hashim A, Tahir MJ, Ullah I, Asghar MS, Siddiqi H, Yousaf Z. The utility of point of care ultrasonography (POCUS). Ann Med Surg (Lond). 2021 Nov 2;71:102982. doi: 10.1016/j.amsu.2021.102982. PMID: 34840746; PMCID: PMC8606703.
4. Kwee TC, Kwee RM. Point-of-care ultrasound (POCUS): An opportunity for radiologists to improve patient care? Eur J Radiol. 2021 Jun;139:109690. doi: 10.1016/j.ejrad.2021.109690. Epub 2021 Mar 30. PMID: 33823372.
5. Ward MJ, Sodickson A, Diercks DB, Raja AS. Cost-effectiveness of lower extremity compression ultrasound in emergency department patients with a high risk of hemodynamically stable pulmonary embolism. Acad Emerg Med. 2011 Jan;18(1):22-31. doi: 10.1111/j.1553-2712.2010.00957.x. PMID: 21414059.
6. Sorensen B, Hunskaar S. Point-of-care ultrasound in primary care: a systematic review of generalist performed point-of-care ultrasound in unselected populations. Ultrasound J. 2019 Nov 19;11(1):31. doi: 10.1186/s13089-019-0145-4. PMID: 31749019; PMCID: PMC6868077.
7. Ben-Baruch Golan Y, Sadeh R, Mizrakli Y, Shafat T, Sagy I, Slutsky T, Kobal SL, Novack V, Fuchs L. Early Point-of-Care Ultrasound Assessment for Medical Patients Reduces Time to Appropriate Treatment: A Pilot Randomized Controlled Trial. Ultrasound Med Biol. 2020 Aug;46(8):1908-1915. doi: 10.1016/j.ultrasmedbio.2020.03.023. Epub 2020 May 16. PMID: 32430108.
8. Araujo KG, Adriana Y, Machado HC, Sarian LO, Derchain S. Handheld ultrasound device in the assessment of the uterus and adnexa. Research Square [Preprint]. 2024 Apr 17. doi:10.21203/rs.3.rs-4145052/v1.
9. Moore CL, Molina AA, Lin H. Ultrasonography in community emergency departments in the United States: access to ultrasonography performed by consultants and status of emergency physician-performed ultrasonography. Ann Emerg Med. 2006 Feb;47(2):147-53. doi: 10.1016/j.annemergmed.2005.08.023. Epub 2005 Nov 21. PMID: 16431225.
10. Chelikam N, Vyas A, Desai R, Khan N, Raol K, Kavarthapu A, Kamani P, Ibrahim G, Madireddy S, Pothuru S, Shah P, Patel UK. Past and Present of Point-of-Care Ultrasound (PoCUS): A Narrative Review. Cureus. 2023 Dec 8;15(12):e50155. doi: 10.7759/cureus.50155. PMID: 38192958; PMCID: PMC10771967.
11. Seth N, Yadav H, Varshney DK, Verma S, Srivastav M. Comparative evaluation of point-of-care ultrasound (POCUS) and computed tomography (CT) in diagnosing acute abdomen in emergency settings: a prospective observational study. Int J Curr Pharm Rev Res. 2025;17(7):571–575.