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Evaluation of The Effectiveness of Abdominal and Vaginal B-Ultrasound in The Diagnosis of Acute Abdomen in Obstetrics and Gynecology

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Abstract: *Objective:* To explore the clinical effect of the combined application of abdominal and vaginal B-ultrasound in the diagnosis of acute abdomen in obstetrics and gynecology. *Methods:* Eighty patients admitted to our hospital from March 2023 to March 2024 were selected, all of whom were acute abdomen patients admitted to the Department of Obstetrics and Gynecology. In this study, the patients were divided into two groups. One group of 40 patients was given a simple abdominal B-ultrasound diagnosis (control group). The other group of 40 patients was given both abdominal and vaginal B-ultrasound examinations (experimental group). The diagnostic accuracy between the two groups was compared. *Results:* Patients in the experimental group had higher consistency rates with pathological diagnosis results in ectopic pregnancy rupture, embryonic arrest, acute pelvic inflammation, corpus luteum rupture, and intrauterine adhesions as compared to the control group. At the same time, the inspection accuracy rate of the experimental group (92.50%) was higher than that of the control group (70.00%) ($P < 0.05$). *Conclusion:* The combined application of abdominal and vaginal B-ultrasound in the diagnosis of acute abdomen was of great significance in improving the accuracy of clinical diagnosis and guiding doctors to provide effective treatment.

Keywords: Abdominal B-ultrasound; Vaginal B-ultrasound; Obstetrics and gynecology; Acute abdomen; Diagnostic value

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1. Introduction

Acute abdomen in obstetrics and gynecology usually refers to patients who are present with symptoms of acute lower abdominal pain. This disease has a high clinical incidence and is characterized by an acute onset and changes in the patient's condition. After the onset of the disease, clinical symptoms mainly include severe abdominal pain and internal and external bleeding. To ensure effective treatment for patients, it is important to improve the accuracy of clinical diagnosis. Ultrasound examination is the main clinical tool for diagnosing acute abdomen in obstetrics and gynecology. It has a wide range of clinical applications and is mainly used to observe the morphology and internal state of the uterus [1,2]. It is relatively simple to operate and safe. To further

explore the clinical application value of this method, this study takes the patients selected in our hospital as an example and uses the combined application of abdominal B-ultrasound and vaginal B-ultrasound to determine its effectiveness in diagnosing acute abdomen.

2. Materials and methods

2.1. Data analysis

A total of 80 patients admitted to our hospital from March 2023 to March 2024 were selected as research subjects in this study, all of whom were obstetric and gynecological acute abdomen patients. This research was carried out in the form of a comparative experiment and the patients were divided into two groups randomly, namely the experimental group and the control group. There were 40 patients in the experimental group, where the oldest was 64 years old and the youngest was 16 years old. The mean age of the patients was 45.56 ± 5.45 years old. The longest treatment duration was 49 hours, and the shortest was 20 minutes, with an average of 11.56 ± 3.23 hours. There was a total of 40 patients in the control group, aged 18–66 years old, with an average age of 45.29 ± 5.10 years. The patient's treatment duration ranged from 25 min to 50 h, with an average of 11.65 ± 5.10 h. The various data from the two groups of patients were comparatively analyzed and the results were statistically significant ($P > 0.05$), indicating that this experimental study met the research standards.

2.2. Method

The 40 patients in the control group were given a simple abdominal B-ultrasound examination. During the implementation, an ultrasonic detector (Toshiba Corporation of Japan, model SSA-790A) was used. During the examination, the patient's bladder was filled first, or 500 mL of sterile saline was injected into the patient's bladder. Then, according to the patient's condition, the probe frequency was set at mainly 2.0–5.0MHz. The patient was then instructed to assume the supine position. Before the examination, a small amount of coupling agent was applied to the probe and a scan was carried out through the patient's abdomen above the pubic symphysis. The scan was mainly transverse and longitudinal. The patient's pelvic condition was carefully observed to analyze whether there was a gestational sac, effusion, and mass, etc. At the same time, the patient's uterus and bilateral appendages were scanned to determine any positive signs of an acute abdomen.

The 40 patients in the experimental group were given a combined detection method of abdominal and vaginal B-ultrasound, in which the examination method of abdominal B-ultrasound was the same as that of the control group. During vaginal B-ultrasound examination, an ultrasonic detector was used. The patient was guided to empty their bladder and adopt the correct position for bladder lithotomy. The ultrasonic diagnostic instrument was applied and the probe frequency was set to 4.00–7.5MHz. A condom was put on the probe and slowly inserted into the patient's vagina to ensure that the probe could properly fit the cervical fornix. Then, the probe was rotated to achieve a comprehensive observation of the patient's abdomen, including the pelvic cavity, uterine cavity, and other accessories, focusing on multi-angle and cross-section inspection. At the same time, the patient's blood flow and endometrium conditions were observed to judge whether the patient's pelvic cavity is accompanied by a gestational sac and to analyze whether there is fluid accumulation and masses [3,4].

2.3. Observation indicators

Based on the final pathological diagnosis results, the consistency rate of the two examination methods was compared and analyzed, and the differences in the diagnostic accuracy were analyzed.

2.4. Statistical analysis

Statistical analysis was carried out using the SPSS 26.0 software. Measurement data were expressed as mean ± standard deviation and count data were expressed as %. During data processing, the data between different groups was compared and analyzed using the *t*-test and chi-squared (χ^2) test. Results were considered statistically significant at $P < 0.05$.

3. Results

3.1. Compliance rate of pathological results

As shown in **Table 1**, patients in the experimental group had higher consistency rates with the pathological diagnosis results in terms of ectopic pregnancy rupture, embryonic cessation of development, acute pelvic inflammatory disease, corpus luteum rupture, and intrauterine adhesions as compared to those in the control group.

Table 1. Comparative observation of the differences in diagnostic results and pathological results between the two groups [*n* (%)]

Group	Rupture of ectopic pregnancy	The embryo stops developing	Acute pelvic inflammatory disease	Rupture of corpus luteum	Intrauterine adhesions
Pathology ($n = 40$)	20 (50.00)	8 (20.00)	6 (15.00)	3 (7.50)	3 (7.50)
Experimental group ($n = 40$)	19 (47.50)	8 (20.00)	5 (12.50)	3 (7.50)	2 (5.00)
Control group ($n = 40$)	12 (30.00)	6 (15.00)	3 (7.50)	5 (12.50)	2 (5.00)

3.2. Comparison of the accuracy of examination methods

As shown in **Table 2**, the inspection accuracy rate of the experimental group (92.50%) was higher than that of the control group (70.00%) ($P < 0.05$). Overall, the experimental group had a higher inspection accuracy and a better outcome.

Table 2. Comparison of the diagnostic accuracy of the examination methods between the two groups [*n* (%)]

Group	Number of people detected (*n*)	Accuracy (%)
Test group ($n = 40$)	37	92.50%
Control group ($n = 40$)	28	70.00%
χ^2		6.646
P		0.010

4. Discussion

Obstetric and gynecological acute abdomen is a disease with a high clinical incidence. Patients are mainly presented with symptoms of acute lower abdominal pain, including a variety of gynecological diseases [5–8]. When clinically treating patients with acute abdomen, it is important to conduct early screening of the disease to accurately judge the patient's condition. This can avoid delays in treatment and enhance the treatment success rate and outcome [9,10].

Currently, the main tool for clinical diagnosis of patients with acute abdomen includes ultrasonic diagnostic

equipment. Ultrasound equipment has a high resolution, is easy to use, and is cheap. It can display the patient's endometrium, myometrium, and pelvic conditions, which is of great significance for judging the patient's condition [11–13].

There are two main types of ultrasound technologies commonly used in clinical practice, namely abdominal ultrasound and vaginal ultrasound [14]. The abdominal B-ultrasound is simple to operate. However, it is prone to misdiagnosis when used alone and is easily affected by patient influence and intestinal gas, which is not conducive to clinical diagnosis. On the other hand, the vaginal B-ultrasound diagnostic method uses a high-frequency probe to facilitate inspection inside the patient's pelvic tissue. It does not require treatment of the patient's bladder, hence it is less time-consuming [15]. When compared with the abdominal B-ultrasound method, the vaginal B-ultrasound examination method produces clearer images and allows observation of smaller lesions. However, this method is inaccurate in diagnosing extremely large lesions and is prone to misdiagnosis. Based on this, the joint application of the two methods can overcome shortcomings, promote the effectiveness of the two diagnostic methods, and improve the accuracy of clinical diagnosis.

5. Conclusion

The combined application of abdominal and vaginal B-ultrasound in patients with acute abdomen in obstetrics and gynecology improved the diagnostic accuracy and had significant application value. Hence, it is worthy of promotion.

Disclosure statement

The authors declare no conflict of interest.

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