

# Comparison of hysterosonography and hysteroscopy for diagnosing perimenopausal bleeding

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## Summary

This investigation was a prospective study performed at the Gynecological Clinic "Narodni Front" in Belgrade. In the investigated group, endometrial hyperplasia, endometrial polyp, and myoma were diagnosed as the most frequent causes of bleeding during perimenopause. The test group of patients was then subjected to hysterosonography in order to diagnose bleeding etiology, followed by hysteroscopy to confirm its etiology based on hysterosonography. Material was sent for histopathological analysis to definitely confirm the diagnosis. The aim of this study was to compare the findings of hysterosonography and hysteroscopy to evaluate the sensitivity and efficacy of hysterosonography for diagnosing the etiology of uterine bleeding in perimenopausal women. In the diagnostics of submucosal myoma, endometrial hyperplasia, and endometrial polyps, hysterosonography has proven to be a good screening method. By its use for diagnosing intracavitary uterine pathology, and thus also the pathology of bleeding in perimenopausal women, in many cases hysteroscopy can be avoided. This is a method that is easy to perform, less invasive, less costly to perform, and is well-tolerated.

**Key words:** Perimenopausis; Endometrial hyperplasia; Endometrial polyp; Uterine myoma; Hysteroscopy; Hysterosonography.

## Introduction

The most common causes of bleeding during perimenopause are endometrial hyperplasia, endometrial polyps, and uterine myoma. In a retrospective study of endometrial curettage in patients with irregular endometrial hyperplasia, endometrial carcinoma was found in one percent of cases with simplex hyperplasia, in three percent of cases with complex hyperplasia, in eight percent of cases with atypical simplex hyperplasia, and in 29% of cases with atypical complex hyperplasia [1, 2]. Endometrial polyps are the most common cause of irregular bleeding outside the menstrual cycle. Myomas are very frequent benign tumors of the uterus. Approximately 30% of women have a fibroid tumor, and 20%-30% of myomas exhibit clinical symptoms [3]. Saline infusion sonohysteroscopy (SIS) is a method enabling the diagnosing of certain pathological states in the uterine cavity and thus also to discover the causes for perimenopausal bleeding [4]. One of the benefits also relates to differential diagnostics between a focal lesion and generalized endometrial thickening, as well as a polyp and submucosal myoma. Hysteroscopy, as an endoscopic method for imaging the uterine cavity, simultaneously enables both the discovering and removal of the cause of perimenopausal bleeding [5-7].

## Materials and Methods

This investigation was a prospective study performed at Gynecological Clinic "Narodni Front" in Belgrade. It comprised of 50 patients aged 37-50 years, suffering from perimenopausal bleeding. The majority of patients had a menstrual cycle, which

was not abundant, and within a duration interval from a minimum of 15 days to a maximum of 55 days. Colposcopy, blood pressure (BP), complete blood cell count, ultrasonography investigation, hysterosonography, and hysteroscopy were performed in all patients. From January 1, 2010 to January 1, 2011, patients were checked by ultrasonography to evaluate perimenopausal bleeding. In the investigated group, endometrial hyperplasia, endometrial polyp, and myoma were diagnosed as the most frequent causes of perimenopausal bleeding. Check-ups were done using an ultrasonic apparatus with a five MHz transvaginal probe. In each patient, the uterine cavity was checked in the sagittal and the transversal planes. The test group of patients was then subjected to hysterosonography in order to diagnose bleeding etiology, followed by hysteroscopy to confirm the bleeding etiology based on hysterosonography. Hysterosonography was done in the outpatient department, with a previously checked cervical smear, colposcopy finding, and BP. Under speculum control, a pediatric intraumbilical catheter was placed transcervically in the uterine cavity, and the medium – physiological saline was injected, which separated the edges of the cavity and demonstrated its content [8, 9]. Then, using an ultrasonography apparatus with a five MHz transvaginal probe, the uterine cavity was checked in the sagittal and the transversal planes. The hysteroscopic examination was done using a rigid eight-mm diameter hysteroscope, with previous cervical dilatation to Haegar no. 8. The uterine cavity was distended using physiological solution. Instruments for performing excision, biopsy, or electrocoagulation were inserted via the hysteroscope. Material was sent for histopathologic analysis to definitely confirm the diagnosis. Anesthesia was mainly intravenous or endotracheal. Obtained data were processed using descriptive statistics methods (SV, SD, MIN, and MAX) and analytical statistics methods (Student T test, Chi-squared test, Wilcoxon test, Spearman, and Pearson correlations). The data base was created on a PC, using the SPSS 10.0 statistical package. The aim of this study was to compare hysterosonography and hysteroscopy findings in order to evaluate the sensitivity and efficacy of hysterosonography for diagnosing the etiology of uterine bleeding in perimenopausal women.

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## Results

The authors studied 50 patients suffering from perimenopausal bleeding. Their average age was  $47 \pm 3.6$  years. Patients aged 40-49 years were the most common with 73.4%, followed by patients aged 50-54 years with 16.3%, while patients aged over 55 years were less common with 8.2%, and patients aged 35-39 years were the least common with 2.1%. Statistical analysis of obtained data showed a statistically highly significant difference ( $\chi^2 = 25.388$ ;  $p < 0.01$ ) in patients aged 40-49 years, compared to patients aged 35-39 years. Before hysterosonography and hysteroscopy, an ultrasound examination was done in all patients. A regular finding was diagnosed in two percent of patients, endometrial hyperplasia in 46.9%, endometrial polyp in 40.9%, and myoma in 10.2% of patients. Presented data showed a higher incidence of endometrial hyperplasia compared to submucosal myoma. Hysterosonography most frequently diagnosed endometrial polyp, in 55.1% of patients, followed by endometrial hyperplasia in 30.6%, and submucosal myoma in 14.3% of patients. Presented data shows that endometrial polyps are more frequent than submucosal myomas, with a statistically significant difference ( $\chi^2 = 12.408$ ;  $p < 0.01$ ). Hysteroscopy diagnosed endometrial polyps in 53.1% of patients, endometrial hyperplasia in 32.6% of patients, and submucous myomas in 14.3% of patients. Presented data indicate a more frequent presence of endometrial polyps compared to submucosal myomas. The established difference was statistically significant ( $\chi^2 = 11.061$ ;  $p < 0.01$ ). Material obtained by biopsy during hysteroscopy was processed by histopathology. Histopathologically, endometrial polyps were found in 53.1% of patients, endometrial hyperplasia in 32.6% of patients, while submucosal myomas were present in 14.3% of patients. Presented data indicated a more frequent presence of endometrial polyps compared to submucosal myomas. These results are presented in Table 1. Hysterosonographic findings show a high percentage of agreement with histopathological findings, in 98% of cases, differing in only two percent of cases. The lack of agreement appeared in histopathological diagnosis of hyperplasia, where in two percent of patients hysterosonography showed endometrial polyp. Presented results show no statistically significant difference ( $z = -1.000$ ;  $p > 0.05$ ) between hysterosonographic and histopathologic findings. These results are presented in Table 2. Hysteroscopic findings show an agreement with histopathological findings in 100% of cases. Hysterosonographic findings show an agreement with hysteroscopic findings in 98% of cases, with a difference in only two percent of cases. Lack of agreement was found in the hysteroscopic diagnosis of hyperplasia, where in two percent of patients, hysterosonography found an endometrial polyp. Presented results show no statistically significant difference ( $z = -1.000$ ;  $p > 0.05$ ) between hysterosonographic and hysteroscopic findings. These results are presented in Table 3. Hysteroscopy had the highest level of sensitivity of 100%. The SIS method

also demonstrated a satisfactory sensitivity of 98%. Specificity of hysteroscopy as a diagnostic method was 100%, and for SIS was 97%. Statistical data processing established no statistically significant difference for specificity between hysteroscopy and hysterosonography. Hysteroscopy had the highest positive predictive value of 100%, while for SIS this was 96%. These results are presented in Table 4. For hysteroscopy, there were no false positive findings, while SIS had four percent false positive findings. Obtained data showed no statistically significant difference between hysteroscopy and hysterosonography. Hysteroscopy had no false negative findings, while SIS had three percent false negative results. Obtained data show no statistically significant difference between hysteroscopy and hysterosonography.

## Discussion

This prospective study included 50 patients suffering from perimenopausal bleeding, and in order to diagnose the bleeding, after detailed laboratory and colposcopic preparation, they were checked by ultrasonography, hysterosonography, and hysteroscopy. Patients were between 37 and 50 years of age, with a mean age of 47. The most common population were women aged between 40 and 49 years. The duration of the menstrual cycle was from a minimum of 15 days to a maximum of 55 days. The largest number of patients (as high as 61.2%) had regular cycles lasting 21-35 days. Most cases, approximately two-third of patients, did not have abundant menstruations, therefore a high number of patients had a normal blood count, with anemia present in only a small percentage. All patients were processed by colposcopy and BP, with a high percentage of regular findings, and pathological findings in only 4.1% of cases. To contribute to resolving the dilemma regarding the use of various diagnostic techniques and to compare results, percentages for sensitivity, specificity, and positive and negative predictive values, were established for the applied diagnostic techniques. For all patients an ultrasonographic examination was performed, and in a high percent of cases, endometrial hyperplasia was found (46.9%), followed by endometrial polyp (40.9%), submucosal myoma (0.2%), with a regular finding in only two percent of patients. In one study, 84 patients with abnormal bleeding were subjected to transvaginal ultrasound (TVUS), followed by hysteroscopy. Results were compared with results of biopsy, surgical hysteroscopy, and hysterectomy. Based on results obtained for sensitivity, specificity, positive and negative predictive values, hysteroscopy had higher sensitivity (TVUS 67.3%, hysterosonography 91.6%). It was concluded that TVUS is an excellent initial diagnostic method, but HS is a much more precise diagnostic method for evaluating abnormal bleeding in perimenopause. [10]. Subsequently, all patients were subjected to a sonohysteroscopic examination. This method diagnosed no regular findings, while the most common finding was endometrial polyp in approximately one-half of cases (55.1%). In almost one-third of patients (30.6%),

Table 1. — *Compatibility of the hysterosonographic and histopathological findings in the study group of patients.*

Hysterosonography	Histopathological finding		
	Polyp	Myoma	Hyperplasia
Polyp	53.1	0	2
Myoma	0	14.3	0
Hyperplasia	0	0	30.6
Total	53.1	14.3	32.6

Table 2. — *Compatibility of the hysteroscopic and histopathological findings in the study group of patients.*

Hysteroscopy	Histopathology finding		
	Polyp	Myoma	Hyperplasia
Polyp	53.1	0	0
Myoma	0	14.3	0
Hyperplasia	0	0	32.6
Total	53.1	14.3	32.6

Table 3. — *Compatibility of the hysterosonographic and hysteroscopic findings in the study group of patients.*

Hysterosonography	Hysteroscopy		
	Polyp	Myoma	Hyperplasia
Polyp	53.1	0	2
Myoma	0	14.3	0
Hyperplasia	0	0	30.6
Total	53.1	14.3	32.6

Table 4. — *Sensitivity and specificity of implemented diagnostic methods.*

	Hysterosonography	Hysteroscopy
Sensitivity	96%	100%
Specificity	97%	100%
Positive predictive values	96%	100%
False positive values	4%	0%
False negative values	3%	0%

endometrial hyperplasia was found, while the rarest finding was myoma, in only 14.3% of cases. Other authors performed a comparative prospective study for transvaginal color Doppler (TVCD) and hysterosonography for diagnosing endometrial polyp. It included 51 patients between 27 and 75 years of age, mean age 51. Then all patients were subjected to hysteroscopy and endometrial biopsy, and the hystopathologic finding was used as the gold standard. Forty-one endometrial polyps, three endometrial hyperplasias, four atrophic cystic hyperplasias, two proliferative endometriums, and one case of endometritis, were confirmed. Based on sensitivity and specificity for TVCD (95% and 80%) and hysterosonography (100% and 80%), it was concluded that TVCD and hysterosonography had similar performances in diagnosing endometrial polyps [11]. In this study, after sonohysteroscopy, hysteroscopic examination was also performed for this group of patients, and in most cases endometrial polyps (53.1%) were diagnosed, followed by endometrial hyperplasia (32.6%), with myomas in only 14.3% of cases. In a randomized study of 148 patients,

subjected to hysteroscopy, pathological lesions were not diagnosed in 37 patients, in five patients both a polyp and a myoma were found, in 43 patients endometrial polyps, and in 20 submucosal myomas were diagnosed. The authors concluded that the pathology of abnormal bleeding is dominated by endometrial polyps and submucosal myomas, and that in some cases only hysteroscopy was the method of choice to diagnose the pathology of uterine bleeding [12]. All material obtained by biopsy during hysteroscopy diagnosis was sent for hystopathological analysis. In the present investigation, hystopathological findings confirmed the hysteroscopic diagnosis in 100% of cases, i.e. endometrial polyps were confirmed in 53.1% of patients, followed by endometrial hyperplasia in 32.6% of cases, and the least frequent, myomas in 14.3%. Hysteroscopy proved to be also a good method of choice in diagnosing and typization of endometrial pathology in abnormal perimenopausal bleeding. As for ultrasonographic findings, when compared to the hystopathological findings, they demonstrated an agreement in 79.6% of cases, with findings differing in 20.4% of cases. The highest percentage of disagreement was for histopathologically-diagnosed polyps, which were declared as regular findings by ultrasonography in two percent of cases, and as endometrial hyperplasia in 14.3% of cases. There was also a somewhat lower agreement in diagnosing myomas, which was seen as an endometrial polyp in 4.1% of patients. In a high percentage, in 98% of cases, hysterosonographic diagnostics agreed with histopathological findings. The highest disagreement was for histopathological diagnostics of endometrial hyperplasia, where in two percent of patients an endometrial polyp was seen. In one study in menopausal patients (419) with uterine bleeding, diagnostics of endometrial pathology were compared using TVUS and hysteroscopic with the hystopathology findings of the endometrium used as the basic standard. Based on obtained results, it was established that TVUS is the method of choice for investigating the endometrium limited to a thickness of four-mm (double layer technique) in postmenopausal patients with irregular bleeding, while hysteroscopy is a much more precise method than TVUS for all patients, especially for endometrium with a thickness of over four-mm. [13]. In the present investigation, hysterosonographic diagnostics, in 98% of cases agreed with hystopathological findings. A study which performed a comparison between SIS and hysterosonography in postmenopausal patients with abnormal bleeding found no significant difference for sensitivity and specificity between SIS and diagnostic hysteroscopy [14]. In the present study, the least agreement between hysterosonography and hysteroscopy was found for histopathological diagnosis of endometrial hyperplasia, where in two percent of patients an endometrial polyp was seen. One prospective study performed a comparison between TVUS, SIS, and hysterosonography as diagnostic methods in premenopausal patients with abnormal uterine bleeding. TVUS demonstrated a sensitivity of 60% in direct visualization of intracavitary abnormalities, with a specificity of 93%. For SIS, sensi-

tivity was 88% and specificity 95%. Authors concluded that SIS is a more accurate method than TVUS for diagnosing intracavitary lesions in premenopausal patients. The use of TVUS and SIS to diagnose intracavitary lesions in an endometrium thicker than five mm can in most cases reduce the number of hysteroscopies [15]. In the present study, in the selected sample, hysteroscopic findings demonstrated the highest percent of agreement in 100% of cases, with histopathological findings.

## Conclusion

In the diagnostics of intracavitary uterine pathology in women with perimenopausal bleeding, hysteroscopy appears to be the best diagnostic method, followed by hysterosonography. In the diagnostics of submucosal myomas, endometrial hyperplasia, and endometrial polyps, hysterosonography has proven to be a good screening method. Through its use for diagnosing intracavitary uterine pathology, and thus also the pathology of bleeding in perimenopausal women, in many cases hysteroscopy can be avoided. This is a method that is simple, less invasive, less costly, and is well-tolerated.

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