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PERSISTENT ENDOMETRITIS AND INFERTILITY: CLINICAL AND MORPHOLOGICAL ASPECTS

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Abstract. *Objective. This work seeks to strengthen the diagnostic framework for chronic (persistent) endometritis (CE) by clarifying contributory risk factors among infertile women and by evaluating the diagnostic performance of office hysteroscopy combined with targeted endometrial biopsy. The overarching aim is to improve diagnostic precision, reduce unnecessary invasive procedures, and harmonize decision-making with contemporary evidence-based criteria.*

Materials and Methods. We conducted a retrospective analysis of medical records of women with CE and a history of infertility managed between 2024 and 2025 at the Republican Specialized Medical Center for Mother and Child Health, Tashkent. Data included reproductive history, prior uterine interventions, imaging (ultrasound with Doppler), office hysteroscopy findings, and histology of endometrial biopsies.

Results. Historical curettage of the uterine cavity—particularly when coupled with or performed outside of hysteroscopic control—emerged as a leading risk factor for CE. In contrast, office hysteroscopy with selective biopsy demonstrated high sensitivity and acceptable specificity for detecting chronic inflammatory and morphologic changes of the endometrium. Diagnostic thresholds incorporating ≥5 plasma cells per 10 high-power fields (HPF) enhanced interpretability when integrated with hysteroscopic visual criteria.

Keywords: *chronic endometritis; infertility; office hysteroscopy; endometrial biopsy; diagnostic criteria; risk factors.*

Introduction. Chronic or persistent endometritis (CE) is a clinico-morphological condition characterized by long-standing inflammatory injury of the endometrium from infectious or post-procedural etiologies, yielding secondary structural and functional changes that disrupt cyclical regeneration, receptivity, and implantation potential [1]. Considerable heterogeneity in reported prevalence among infertile women (0.2–46%) underscores variability in diagnostic approaches and case definitions across studies [2].

Clinically, CE has been associated with adverse reproductive outcomes—recurrent implantation failure, early pregnancy losses including non-developing pregnancies, and a higher frequency of ectopic gestations—thereby making its timely recognition a priority in reproductive medicine. Proposed pathophysiological mechanisms include receptor dysregulation, aberrant vascular remodeling, persistent immune activation with lymphoplasmacytic infiltration, and oxidative stress, collectively compromising the endometrial niche.

Given this complexity, current practice favors an integrated diagnostic pathway that combines thorough history-taking and risk stratification with transvaginal ultrasound (including Doppler flow assessment), diagnostic hysteroscopy with endometrial sampling, and—where feasible—microbiological or molecular profiling of the endometrial microbiome [3, 4]. The sonographic picture in CE is non-specific but typically includes heterogeneous echotexture, alternating hypo-/hyperechogenic foci (often 1–3 mm fibrotic loci in the basal layer), irregular endometrial contour, and subendometrial myometrial changes. Doppler may reveal altered endometrial or myometrial perfusion patterns [5].

Hysteroscopy remains pivotal for direct visualization. The International Working Group for Standardization of CE Diagnosis delineates reproducible visual markers: micro-polyps, stromal edema, focal hyperemia, a "strawberry-like" mucosal pattern, and petechial hemorrhages with reported frequencies of approximately 25%, 30%, 20%, 10%, and 15%, respectively [6]. Histological confirmation—recognized as the gold standard—relies on identification of lymphoplasmacytic infiltrates with emphasis on plasma cells, stromal fibrosis, and sclerosis of spiral arterioles; a threshold of ≥5 plasma cells per 10 HPF is widely considered robust, with borderline cases interpreted alongside clinical and hysteroscopic context [7].

Materials and Methods. Study Design and Setting. We performed a retrospective cohort analysis based on hospital records from the Republican Specialized Medical Center for Mother and Child Health (Tashkent), covering January 2024 through December 2025. Eligibility included women aged 21–45 years with a history of infertility who underwent office hysteroscopy and endometrial biopsy with subsequent histology.

Participants and Data Sources. The analytic sample comprised 175 patients. Baseline data captured reproductive history, prior gynecologic diagnoses and surgeries, obstetric history, and prior intrauterine procedures. Non-CE infertility factors (endocrine, tubal-peritoneal, and male factors) were excluded to minimize confounding.

Imaging and Endoscopic Evaluation. All patients underwent transvaginal ultrasound with Doppler interrogation of endometrial and myometrial perfusion. Office hysteroscopy was performed using standard fluid distension media and low-pressure settings to enhance visualization of subtle inflammatory markers (micro-polyps, edema, focal hyperemia). Targeted endometrial biopsies were obtained from visually suspect areas and from the posterior wall/fundus when visual clues were absent, to reduce sampling error.

Histopathology. Biopsy specimens were processed under routine protocols. Histological criteria for CE included lymphoplasmacytic infiltrates with quantification of plasma cells. A threshold of five or more plasma cells across ten HPF was adopted as the principal diagnostic benchmark, following published expert consensus. Borderline cases (<5/10 HPF) were adjudicated by integrating clinical data and hysteroscopic appearance.

Outcomes and Analysis. Primary outcomes comprised: (i) the proportion of CE among infertile women undergoing hysteroscopy; (ii) distribution of putative risk factors; and (iii) the diagnostic yield of the combined hysteroscopic–histologic approach. Secondary outcomes included reproductive history patterns and the frequency of pregnancy-related complications. Descriptive statistics (percentages) summarize findings consistent with the source dataset.

Results. Prevalence and Demographics. Among 175 infertile women evaluated, CE was identified as the proximate cause of infertility in 120 cases (69%). The highest concentration of cases occurred between ages 29 and 37, reflecting the active diagnostic period in many infertility evaluations. The mean duration of infertility in women with CE was approximately six years, highlighting delays in comprehensive assessment and potential under-recognition of CE.

Clinical Presentation. Beyond infertility, patients frequently reported menstrual irregularities in 10.7% of cases (abnormal uterine bleeding 5.8%, oligomenorrhea 3.2%). Pain syndromes resembling secondary dysmenorrhea were noted in 1.7%.

Risk Factors. Prior intrauterine manipulation emerged as a dominant theme. In 52% of the cohort, hysteroscopic procedures had been performed previously—polypectomy (7.4%), myomectomy (2.5%), with the most frequent being diagnostic hysteroscopy combined with curettage (42.1%). Independent of hysteroscopy, curettage without visual control accounted for 35.5% of antecedent interventions, often performed for pregnancy termination. Cesarean section was present in 19% of histories. Postpartum complications and pelvic inflammatory disease were relatively uncommon (5% and 1.7%, respectively). Primary infertility accounted for 32% while secondary infertility was more prevalent at 68%.

Reproductive Outcomes. A substantial 83.5% of women experienced pregnancy-related complications: unsuccessful IVF attempts in 33.9%, non-developing pregnancies in 30.6%, and ectopic pregnancies in 19%. These data illustrate the negative reproductive trajectory frequently accompanying CE.

Diagnostic Concordance and Performance. In 67% of cases, hysteroscopic impressions were corroborated by histology. In 14%, a positive hysteroscopic picture was not mirrored by classic histological criteria, although related findings—polyps, focal hyperplasia, or phase-discordant endometrial structure—were identified. Conversely, 19% lacked visual markers yet met histologic thresholds for CE. The composite diagnostic strategy yielded an estimated sensitivity of 86% and specificity of 76.1%, indicating strong rule-in capacity when modalities are combined.

Conclusion. Chronic endometritis is both prevalent and clinically consequential among women with infertility. The data from this cohort underscore two key imperatives for practice: first, discretionary use of uterine curettage—particularly as a stand-alone diagnostic tactic—given its association with CE; second, prioritization of office hysteroscopy with targeted endometrial biopsy as a high-value pathway that aligns visual cues with histological confirmation. Standardization around the ≥5 plasma cells/10 HPF threshold, in conjunction with hysteroscopic criteria, can attenuate over- or under-diagnosis.

Where resources permit, immunohistochemical characterization—particularly markers such as CD38 and CD138—should augment routine histology to strengthen diagnostic confidence and to tailor therapy. Considering the burden of CE on reproductive outcomes, additional prospective studies are warranted to refine risk stratification and to evaluate how management of CE influences success rates in assisted reproduction.

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