

Role of Neutrophil Lymphocyte Ratio at Preoperative Adenomyosis

Diagnosis

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Abstract

The aim of this study was to determine the predictive value of neutrophil lymphocyte ratio in the diagnosis of the adenomyosis. Seventy two 72 perimenopausal patients who underwent hysterectomy and diagnosed as having any additional pathology except adenomyosis according to the histopathological evaluation of the surgical specimens constituted the study group. One hundred 100 perimenopausal patients who underwent hysterectomy due to reasons and had normal findings without any organic pathology (like uterine descensus, dysfunctional uterine bleeding) constituted the control group. Parameters saved in from patient medical records for each case were as following: age, obstetric characteristics, hemoglobin, Neutrophil, lymphocyte, platelet, Mean Platelet Volume, Follicle stimulating hormone, cancer antigen 125, neutrophil lymphocyte ratio. There were no statistically significant differences between the age, neutrophil, lymphocyte, platelet, FSH, Ca125 values. NLR was also higher in the study group (2.3 ± 1.4) compared to the control group (2.1 ± 1.0), but this difference was not statistically significant.

Keywords: Adenomyosis, neutrophil lymphocyte ratio

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Introduction

Adenomyosis is defined as the presence of endometrial gland and stroma in deep myometrial tissue, however real diagnosis can only be made pathologically [1]. As known, in adenomyosis cases, abnormal vaginal bleeding and dysmenorrhea are the most common symptoms, and a soft uterus, larger than normal can be prominent in the physical examination [2]. It is defined that the diagnosis of the adenomyosis according to clinical findings has a quite small ratio of 2.6%-26% in the literature. Because adenomyosis symptoms can also be seen in leiomyomas, endometriosis or endometrial polyps or it's been focused on the possibility that more than pathology can be present at the same time [3]. While abnormal vaginal bleeding is the most common cause of hysterectomy [4], in order to avoid unnecessary interventions before the operation or evaluate non-surgical alternative treatment methods, making real diagnosis is actually important [4,5]. While difficulty to distinguish leiomyoma and adenomyosis by transabdominal ultrasonography is stated [6], it has been focused on that endovaginal sonography is more effective at adenomyosis diagnosis and lots of criterias in the literature related to adenomyosis diagnosis have been mentioned [3,7,8]. Moreover, it's been focused on the possibility that adenomyosis diagnosis is complete by new, high resolution ultrasonography and at a comparable level with magnetic resonance imaging [8,9].

Adenomyosis has similar characteristics with endometriosis for its histopathological and clinical findings. In both cases studies show that cytokine balance changes into inflammation. Lots of studies have been conducted in the literature, that show that neutrophil lymphocyte ratio (NLR) increases due to systemic inflammatory process in endometriosis. In our present study we have studied the role of NLR at preoperative diagnosis of adenomyosis and the sistemic inflammatory effect of adenomyosis.

Material and Method

Patients, who were operated in the gynecology department of Dr. Zekai Tahir Burak Woman's Health Research and Education Hospital within the time interval September 2013 and March 2015, were retrospectively analyzed. Postmenopause was considered FSH >20 and included patients who had been suffering amenorrhea for more than 1 year. Postmenopausal patients were not included in the study. Hystopathological results of hysterectomy specimens

were examined. Except adenomyosis, patients who had additional pathology in their pathological result like uterine myoma, ovarian cyst, tuboovary abscess, endometrial polyp were not included in the study. 72 patients who only had adenomyosis were included in the study group. 100 perimenopausal patients who underwent hysterectomy due to causes like uterine descensus, dysfunctional uterine bleeding, treatment resistant menometrorrhagia and had normal findings without any organic pathology (nor adenomyosis neither other pathologies like uterine myoma, ovarian cyst, tuboovary abscess, endometrial polyp) constituted the control group.

All data were acquired from medical records that related to the following; pregnancy, parity, live birth, abortion, curettage, Haemoglobin value, number and percentage of neutrophils and lymphocytes, number of platelets, mean platelet volume (MPV) value, FSH value, Ca-125 value and neutrophil lymphocyte ratio (NRL) and histopathological findings. Mean and standard deviation values were calculated for continuous variables. The difference between the median values of non-normally distributed variables was analyzed by Mann Whitney U test. Normally distributed variables were evaluated by Student's t test. The sample size was determined according to the central limit theorem results. The p value <0.05 was considered statistically significant. SPSS (Statistical Package for Social Sciences) for Windows 17.0 software was used for statistical analyses (SPSS Inc., Chicago, IL, USA).

Results

Between two groups there was no significant difference in patient's age. It was 51.8 ± 5.4 in the study group, 51.0 ± 5.1 ($p=0.327$) in the control group (Table 1). In the study group the pregnancy rate 5 (2-11) was significantly higher than in the control group 4 (2-10), ($p=0.013$), (Table 1). There were no statistically significant difference between study group and control group in parity, live birth, abortion and curettage rates (Table 1).

One of the laboratory findings, Ca 125 resulted higher in the study group (17.9 ± 11.3) compared to the control group (15.4 ± 13.8) however no statistically significant difference has been detected among them ($p=0.511$) (Table 2). Between two groups no significant difference has been observed in terms of the FSH values ($p=0.095$) (Table 2). There were no statistically significant differences in the hemoglobin, neutrophil, lymphocyte, platelet, MPV values of the hemogram parameters (Table 2).

Table 1. Comparison of demographic characteristics of the groups.

Variables	Adenomyosis group (n:72)	Control group (n:100)	P value
Age	51.8±5.4	51.0±5.1	0.327
Gravida	5 (2–11)	4 (2–10)	0.013
Parity	3 (1–9)	3 (1–7)	0.632
Live Birth	3 (0–7)	3 (1–7)	0.092
Abort	0 (0–4)	0 (0–4)	0.219
D&C	0 (0–8)	0 (0–3)	0.217

The data is given as median (min–max) and median±interquartil range. $p < 0.05$ is statistically significant.

Table 2. Comparison of laboratory characteristics of the groups.

Parametrs	Group 1	Group 2	p
HGB	12.0±1.6	12.0±1.9	0.904
Neutrophil	4.5±2.0	4.3±1.7	0.449
	59.6±9.0	59.1±8.2	0.714
Lenphocyte	2.1±0.6	2.1±0.5	0.923
	29.9±8.3	30.7±7.5	0.498
Platelet	299.2±96.2	304.4±76.5	0.692
MPV	10.0±1.1	10.0±0.8	0.979
FSH	15.0±7.8	14.4±12.8	0.095
CA-125	17.9±11.3	15.4±13.8	0.511
NLR	2.3±1.4	2.1±1.0	0.578

The data is given as Mean + standart deviation. $p < 0.05$ is statistically significant.

Despite the neutrophil lymphocyte ratio (NLR) resulted higher in the study group 2.3±1.4 compared to the control group 2.1±1.0, but this difference was not statistically significant ($p=0.578$) (Table 2).

Discussion

Adenomyosis is defined as the presence of endometrial gland and stroma in deep myometrial tissue, however real diagnosis can only be made pathologically [1]. It is defined that the diagnosis of the adenomyosis according to clinical findings has a quite small ratio of 2.6-26% in the literature. Because adenomyosis symptoms can also be seen in leiomyomas, endometriosis or endometrial polyps or it's been focused on the possibility that more than pathology can be present at the same time [3]. While abnormal vaginal bleeding is the most common cause of hysterectomy [4], in order to avoid unnecessary interventions before the

operation or evaluate non-surgical alternative treatment methods, making real diagnosis is actually important. Adenomyosis has similar characteristics with endometriosis for its histopathological and clinical findings. In both cases studies show that cytokine balance changes into inflammation. In 2015 Zhihung N. et al. found inflammatory cytokines like interleukin (IL) 6, interferon- γ , monocyte chemoattractant protein-1 higher in the group with adenomyosis compared to the control group, moreover they found antiinflammatory cytokines like IL-10 lower [10]. In the meta-analysis made by Benagiano et al. in 2004, they analyzed that the group with adenomyosis and endometriosis had an immune dysfunction compared to the group with eutopic endometrium, that cell proliferation in adhesion molecules and mutation in apoptosis were monitored and as a consequence the cytokines increased and inflammatory mediators were activated. [11]. Again in 2013 Li B. et al. observed in their study that inflammatory mediators like tumor necrosis factor (TNF)- α -cyclooxygenase-2 (COX-2), vascular endothelial growth factor (VEGF) increased in adenomyosis [12]. Studies were published showing that the neutrophil lymphocyte ratio (NLR) increased, one of the systemic inflammation markers in endometriosis. In 2008 Cho S. et al. made a study on 231 patients with endometriosis and 384 healthy patients in the control group and NLR ratio was found significantly higher in the group with endometriosis [13]. In 2013 in the study made by YANG et al. NLR was found significantly higher in the group with endometriosis compared to the control group [14].

NLR which is a simple and easily applicable biomarker of systemic inflammation, has no contribution to preoperative diagnosis of adenomyosis. We think this may be related to the interaction of adenomyosis more likely with a local inflammatory process. Further study is needed related to the diagnostic value of NLR in adenomyosis.

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