Association of Ferritin Levels with Clinical Parameters in Patients with Fibromyalgia Syndrome

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This sectional study included 200 female individuals (control:100, FMS:100) older than 18 years of age who presented to Physical Treatment and Rehabilitation polyclinic in 2016-17 period. The patient group included 100 patients who were selected by simple random sampling among 137 non-anemic FMS patients who had their diagnoses based on 2011 FMS diagnosis criteria of American Rheumatology College and whose ferritin levels were measured in the last four weeks. The control group, on the other hand, consisted of 100 individuals without a FMS diagnosis selected by simple random sampling among 153 individuals, who were non-anemic, who met exclusion criteria and whose ferritin levels were measured in the last four weeks. Individuals who used parenteral or enteral iron in last four weeks, whose hemoglobin level was less than 12 g/dl, who had infection, malignity, active inflammatory arthritis, serious skin variations, serious peripheral vascular disease, iron storing disorder and pregnant or lactating patients were excluded. The study was approved by local ethic committee (17-KAEK-093) and informed consent was taken from all participants. Serum ferritin levels of all participants measured within the last four weeks were obtained from hospital information system records. All FMS patients filled a questionnaire form which included questions about descriptive characteristics, Beck Anxiety Inventory (BAI), Beck Depression Inventory (BDI), Fibromyalgia Impact Questionnaire (FIQ) and Pittsburg Sleep Quality Index (PSQI). Questionnaires were applied only to FMS patient group.

Fibromyalgia Impact Questionnaire (FIQ) is a 10-item evaluation tool developed to measure status, prognosis and outcomes of FMS patients. Total points vary from 0 to 100. Higher points show the effect of FMS on functionality. Validity and reliability of FIQ in Turkish population were shown by Sarmer et al. (13).

Beck Depression Inventory (BDI) is a 21-item questionnaire evaluating the presence and severity of depression. Higher points mean heavier depression (0-9 points: minimum depression; 10-18 points:

slight depression; 19-29 points: moderate depression; 30-63 points: severe depression). Hisli et al. (14) showed validity and reliability of BDI in Turkish population.

Beck Anxiety Inventory is a short, easily applied and graded, 21-item questionnaire to evaluate the severity of patients' anxiety. Total points vary from 0 to 63 (0-9 points: normal; 10-18 points: slight to moderate anxiety; 19-29 points: moderate to severe anxiety and 30-63 points: very severe anxiety). Validity and reliability of BAI in Turkish population were shown by Ulusoy et al. (15).

Pittsburgh Sleep Quality Index (PSQI) is an 18-item questionnaire measuring sleep quality and disorders in a time period of one month. PSQI measures subjective sleep quality, duration and latency of sleep, sleep disorders, habitual sleep efficiency, daytime dysfunction and use of medication for sleeping. PSQI distinguishes "poor" sleep from "good" sleep. Five or higher total points in PSQI mean "poor" sleep. Ağargün et al. (16) showed the validity and reliability of PSQI for Turkish population.

Serum ferritin level was measured in a Roche Cobas e801 autoanalyzer (Roche Diagnostics, Mannheim, Germany) in our hospital laboratory using electrochemiluminescence immunoassay (ECLIA) method. Serum ferritin level less than 30 ng/mL was considered iron deficiency.

Statistical Analyses

Descriptive analyses were carried out to obtain information about general characteristics of study groups. Data from various variables were given as mean ± standard deviation, while data from categorical ones were expressed as n (%). Shapiro-Wilk's test was used to assess the normality of the data. Group means were compared using independent samples t test for normally distributed quantitative variables. Mann Whitney U test was used for quantitative variables with non-normal distribution. Relationships between quantitative variables were evaluated with Pearson correlation coefficient. p levels <0.05 was considered statistically significant. Statistical analyses were carried out using SPSS software (ver. 19.0.0; IBM Corp, Somers, NY).