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ORIGINAL ARTICLE

The relationship between tender point count and disease severity in patients with primary fibromyalgia

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Abstract Objective of this study is to asses the relationship between tender point count (TPC) and the severity of disease in patients with primary fibromyalgia (FM). One hundred and seven female patients with FM diagnosis according to ACR criteria were included to the study. Main outcome measures were fibromyalgia impact questionnaire (FIQ), Beck depression inventory (BDI), visual analog scale (VAS) and tender point assessment. Mean TPC was 14.66 ± 2.50 and mean VAS was 6.6 ± 1.2 cm. Mean total FIQ score and BDI was 62.75 ± 15.57 and 16.17 ± 7.12, respectively. TPC was correlated positively with FIQ and VAS scores. There was no correlation between TPC and age and duration of symptoms. In conclusion, TPC is a simple and noninvasive examination finding that can supply information about the disease severity and the depression in FM.

Keywords Tender point count · Fibromyalgia · Disease severity

Introduction

Fibromyalgia (FM) is characterized by multiple tender points (TP) in the presence of chronic widespread pain [1]. According to American College of Rheumatology (ACR) criteria, the diagnosis has been based on the existence of pain on digital palpation pressure of approximately 4 kg/cm^2 in at least 11 of the 18 TPs. [2]. This is the only finding on physical examination and also there isn't any specific radiological or laboratory diagnostic tool to identify FM. So this makes TPs more important in FM. However, there are still some questions: (1) What is the relationship between TP count (TPC) and the severity of disease? (2) Does TPC predict the new FM? (3) Which TP assessment method is the best one?

In this study, we aimed to find an answer to the first question.

Materials and methods

Patient selection

One hundred and seven female patients with FM diagnosis according to ACR criteria were included in the study. Before inclusion, all patients underwent routine physical examination, blood analysis (thyroid function tests, brucella agglutination and Coombs' tests, C-reactive protein, erythrocyte sedimentation rate, rheumatoid factor and hepatitis markers) and radiological investigation if required for differential diagnosis. The patients with abnormalities in laboratory tests and the patients with lumbar and cervical radiculopathy, and the patients with a history of surgical intervention to cervical or lumbar spine were not taken into the study.

Tender point assessment

The number of TPs were counted by digital palpation performed by pressing the tender areas with approximately

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4 kg/cm^2 pressure (until the pulp of the thumb whitened) [3] by the same investigator.

Beck depression inventory

Depression was assessed using Beck depression index (BDI). A validation and reliability study in a Turkish population was completed by Hisli [4], and a BDI score of 17 or higher was established as a cutoff value for diagnosis of depression.

Fibromyalgia impact questionnaire (FIQ)

FIQ has been demonstrated to be available and valid measurement of health status in FM [5, 6]. We used Turkish version of FIQ to assess disease severity [7]. FIQ is a ten-item self-administered instrument, which measures physical functioning, work status, depression, anxiety, sleep, pain, stiffness, fatigue and well-being. Each item is standardized on a scale from 0 to 10, with 10 indicating greater impairment. A high total value (maximum 100) indicates the greatest impairment and most severe effects on daily activities.

Procedure

Patients were enrolled in the study after providing written informed consent. Demographic information (age, duration of symptoms) was recorded at the first visit. We advised all patients not to use any analgesics or not to do any exercises that could affect the TPC, pain scores or FIQ, for 24 h before the second visit. At the second visit, all patients underwent physical examination for TPC and FIQ, and pain assessment with 0–10 cm visual analog scale (VAS). FIQ administration and physical examination were performed by different investigators who were blinded to other scores.

Statistical analysis

Data were entered into spreadsheets and checked for errors prior to analysis using SPSS program version 15.0. The correlation between TPC and FIQ and VAS scores were investigated by Spearman's correlation analysis. *P* values lower than 0.05 were taken as significant.

Results

Mean age of patients was 38.31 ± 7.97 years (minimum 21, maximum 50). Mean duration of symptoms was 49.4 ± 37.5 months. Mean body mass index (BMI) was 26.54 ± 4.06. Mean TPC was 14.66 ± 2.50 and mean VAS was 6.6 ± 1.2 cm. Mean total FIQ score and BDI was 62.75 ± 15.57 and 16.17 ± 7.12, respectively. Prevalence of depression, which is defined as having BDI scores of 17 or higher, was 44.9% (*n,* 48).

Table 1 The correlation coefficients between TPC and clinical and demographic parameters

	r	*P*
FIQ	0.427	0.000
VAS	0.509	0.000
BDI	0.239	0.013
Age	0.031	0.754
Duration of symptoms	0.011	0.913
BMI	−0.057	0.563

TPC Tender point count, *FIQ* fibromyalgia impact questionnaire, *BDI* Beck depression index, *VAS* visual analog scale, *BMI* body mass index

TPC was correlated positively with FIQ and VAS scores. There was no correlation between TPC and age and duration of symptoms. The correlation coefficients can be seen in Table 1.

Discussion

In this study, we aimed to investigate the relationship between TPC and disease severity in patients with FM. We showed that TPC is an important marker for disease severity in patients with FM. TPC was correlated positively with FIQ and VAS scores and this correlation was independent from the symptom duration. Therefore, TPC is a significant factor also at the beginning of the disease. In many diseases, clinicians work with laboratory or radiological methods for diagnosis and follow-up. But in FM, these methods are useful only for differential diagnosis or to detect concomitant factors. So clinicians require a diagnostic and monitoring tool for FM. But unfortunately there is no specific laboratory or radiological tools yet, and the investigators, therefore, should investigate the importance of TPC as a predictor of disease activity in patients with FM and as a predictor of new FM in normal population and should investigate which TP evaluating technique is proper.

In one of the studies, Tastekin et al. [3] investigated the correlation between myalgic scoring, digital palpation and dolorimetric TPC method and their relationship with FIQ in 36 cases. They concluded that digital tender point count seemed to be sufficient for the assessment, and there is no need for an additional instrument for tender point evaluation. In the study by Mc Veigh et al. [8] performed with 24 patients, the alteration between TPC and total myalgic score (TMS) and correlation with FIQ was investigated in a period of 28 days. They did not find any correlation with FIQ and did not observe significant alteration in TPC. In

this study, they used dolorimetric measurement instead of digital one. In both of these studies, no correlation was detected with dolorimetric TPC and FIQ. However, similar to our study, Tastekin et al. found a correlation with FIQ in their digital TPC measurements. Gupta et al. reported in their population-based prospective study that individuals with higher TPC carries higher risk for development of chronic diffuse pain; however, low pressure pain threshold does not help to estimate the initiation of symptoms [9]. There are studies reporting that TPC shows distress and pain behavior [10–12]. Schoctat and Raspe showed that TPC is not only related to pain but also with high somatic symptom count [13]. In our study, we demonstrated a correlation between TPC and FIQ, which indicates the pain and general disease severity. Several physiologic variables could affect the TPC. Hapidou and Rollman [14] showed that TPC may be affected in the follicular phase of a menstrual cycle in healthy women, and Bellamy et al. [15] have reported diurnal rhythmicity in pain, fatigue and stiffness in patients with FM. But we did not mention about this physiologic change or diurnal change. This seems as a limitation of our study, but we did not evaluate patients at different times for FIQ, TPC, VAS and BDI. So we thought that it would not affect the correlation between them.

Depression seems to be an important problem in FM. It was shown that depression and anxiety are frequent psychiatric disorders seen in FM, and the frequency of depression is 20–80% [16]. In our study, we found the mean BDI score of our cases as 16.17 ± 7.12. When the BDI ≥ 17 was assessed as the presence of depression, we detected depression in 44.9% of our patients and a positive significant correlation between TPC and BDI. However, it is difficult to decide whether TPC is higher in cases with high BDI or BDI is higher in cases with high TPC and more severe disease. But, an unnecessary analysis in routine practice and not to inform patients clearly may negatively affect the psychological status of these FM cases whose prevalence of depression is high. For this reason, it seems to be important to obtain information about the disease severity by a simple method like TPC and to give psychiatric support to the patient.

The limitations of this study are first not to generalize the results of this study to whole population as all our patients were female and second not to demonstrate the alterations in TPC, pain, BDI values of the patients and the correlation between these alterations by monitoring them.

In conclusion, TPC is a simple and noninvasive examination finding that can supply information about the disease severity and the depression in FM. It is an advantage to get information about disease severity even during the examination of the patient. Further studies are needed to demonstrate the correlation and alterations in pain, depression, FIQ and TPC in long-term follow-up.

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