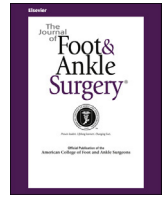




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High Rates of Psychiatric Disorders and Below Normal Mental Capacity Associated With Spastic Peroneal Flatfoot: A New Relationship



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ABSTRACT

Spastic peroneal flatfoot (SPFF) is a rare hindfoot pathology usually seen in the adolescent age group that is characterized by painful spasms in the peroneal muscles. We have clinically observed that patients with SPFF also have some behavioral and emotional difficulties and problems in their academic achievements. Because of these observations, we investigated the prevalence and patterns of psychiatric disorders and intellectual disability among young subjects with SPFF. Our cohort consisted of 16 patients with SPFF. Their mean age at presentation was 21 (range 13 to 31) years. Only 6 patients had a tarsal coalition as an underlying condition. The psychometric evaluation was conducted using validated instruments (Wechsler Intelligence Scale for Children–revised form, Stanford Binet intelligence quotient [IQ] test, and Cattell IQ test). Psychiatric disorders were assessed using a semistructured diagnostic instrument (Schedule for Affective Disorders and Schizophrenia for School Age Children Present and Lifetime Version). The testers and psychiatrists were unaware of the orthopedic condition and the preliminary psychiatric diagnoses. The ethical committee approved the study protocol. The mean follow-up period was 41 (range 12 to 97) months. The mean IQ score of the patients was 75.1 ± 17.9 (range 52 to 107). Compared with the general population, the rate of intellectual disability was significantly greater ($p = .0001$) and the rate of normal intelligence significantly lower ($p = .0015$) in our patient group. Furthermore, according to the community schooling ratio, our cohort also had lower junior high and secondary education rates compared with the general population. The rate of most psychiatric disorders diagnosed in the SPFF patients was greater than that in the normal population. The most commonly identified psychiatric disorders were social phobia and attention deficit and hyperactivity disorder (75%). Timely interventions of the psychosocial and academic problems of patients with SPFF might increase their compliance with orthopedic treatment and help with their psychological well-being and academic achievement. In addition, this relationship might be a clue for uncovering the etiology of this disease, which has not yet been clarified.

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Spastic peroneal flatfoot (SPFF) is a rare hindfoot pathology usually seen in the adolescent age group that is characterized by painful spasms in the peroneal muscles (1,2). Although a tarsal coalition or other painful disorders of the hindfoot have been identified in some cases, the mechanism of the spasms has not yet been fully explained (2,3). Some

investigators have suggested that eversion of the foot is a “splinting” of the subtalar joint secondary to a painful hindfoot condition. The published data have not provided any other characteristic or trait associated with this disorder. We have, in our practice, observed that nearly all patients with SPFF were significantly “compliant” and “easy-going” and uniformly had below normal academic achievement, which might reflect some behavioral or emotional problems and/or limited mental capacity. To the best of our knowledge, this association has not yet been described in reported studies.

The present study investigated the prevalence and patterns of psychiatric disorders and intellectual disability among young subjects with SPFF.

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Conflict of Interest: None reported.

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Fig. 1. Classic clinical appearance of a spastic peroneal flat foot.

Patients and Methods

We obtained institutional review board and ethical committee approval. Sixteen patients were identified from the clinical records, retrospectively, from January 2011 to September 2016. The chief complaints were pain and walking difficulties with spastic peroneal muscles and painful valgus deformity of the ankle and flatfoot. SPFF had been diagnosed in all the patients clinically by a senior orthopedic surgeon (Ö.I.K.) specializing in foot and ankle surgery. The patients were also evaluated radiologically to determine the etiology of the painful spasms (Fig. 1). The mean American Orthopaedic Foot and Ankle Society ankle-hindfoot scale score of the patients was 72 ± 14 at the last follow-up examination. The patients did not have other diseases or syndromes that could have predisposed them to decreased intelligence quotient (IQ) scores and educational achievements.

Of the 16 patients, 6 (37.5%) were found to have a tarsal coalition. A tarsal coalition was not detected in the remaining 10 (62.5%) patients, although magnetic resonance imaging examination showed bone marrow edema in the hindfoot bones of these patients (Fig. 2). Five (31.25%) patients were treated with triple arthrodesis and two (12.5%) with percutaneous screw fixation of the subtalar joint. The remaining 9 (56.25%) patients were followed up clinically and had undergone palliative treatment attempts, including cast immobilization under general anesthesia and/or non-weightbearing for various periods.

These 16 male patients (mean age 19, range 11 to 29 years) were invited for re-evaluation and psychiatric assessment. They and/or their caregivers agreed to participate in the study and were evaluated by experienced child psychiatrists and a psychologist in the Child and Adolescent Psychiatry Department. The IQ scores of the patients

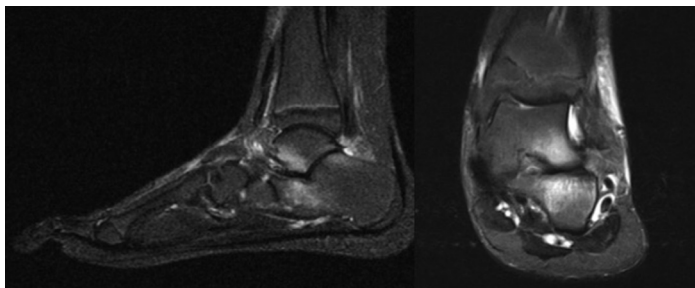


Fig. 2. Magnetic resonance image of the foot and ankle showing edema around the subtalar joint, a common finding in patients with painful hindfoot, in both patients with and without a proven tarsal coalition.

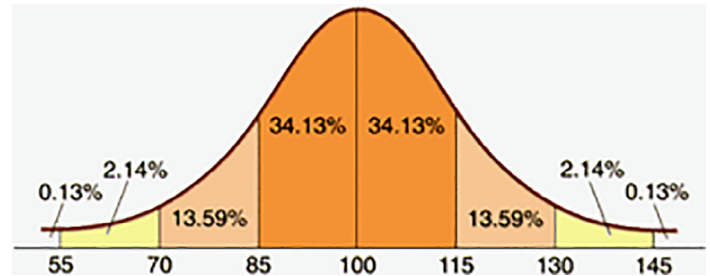


Fig. 3. Bell curve distribution of intelligence quotient (IQ) scores in the community showing that most of the population has an IQ score of ~ 100 , with scores >100 and <100 appearing less frequently.

were evaluated using standardized age-matched psychometric tests. The testers and psychiatrists were unaware of the study's purpose and the patients' orthopedic diagnosis. The Wechsler Intelligence Scale for Children-revised form was applied to 3 patients, the Stanford Binet IQ test was applied to 1 patient, and the Cattell IQ test was applied to 12 (75%) patients, depending on their age. The patients were also interviewed using a semistructured diagnostic instrument, Schedule for Affective Disorders and Schizophrenia for School Age Children Present and Lifetime Version, to diagnose psychiatric disorders. The subjects were also assessed for sociodemographic data and daily life adaptive functioning. In the clinical assessment, intellectual function (conceptual domain), such as reasoning, problem solving, planning, abstract thinking, judgment, academic learning, and learning from experience, were evaluated. The social and practical domains were also evaluated and were included in adaptive functioning.

The normal distribution of the IQ scores in the general population is demonstrated in Fig. 3, with an average score of 100 and standard deviation of 15. Scores with <1 standard deviation are categorized as borderline intelligence (IQ 85 to 70) and mild (IQ 55 to 70), moderate (IQ 35 to 55), severe (IQ 20 to 35), and profound (IQ <20) intellectual disability (4). The normal prevalence rates for these psychiatric disorders were taken from the Diagnostic and Statistical Manual of Mental Disorders, fifth edition, and other large cohort studies (5–8). The results were analyzed using the test for one proportion (MedCalc software, version 11.2.1.0). Statistical significance was accepted as $p = .05$.

Results

The mean IQ score of the patients was 75.1 ± 17.8 (range 52 to 107). The IQ scores were within the normal range for 5 (31.3%), the borderline range for 4 (25%), and mild and moderate intellectual disability range for 7 (43.8%) subjects. Compared with the general population, the rate of intellectual disability was significantly greater ($p = .0001$) and the rate of normal intelligence was significantly lower ($p = .0015$) in our patient group.

One (6.25%) patient successfully graduated from high school. Of the 16 patients, 6 (37.5%) were not able to finish high school, and 6 (37.5%) had quit junior high or were not able to continue their education after junior high. The remaining 3 (18.75%) patients were attending school at the time of the evaluation (Table 1). According to the data from the National Statistical Institute, the schooling proportion as an average of the past 4 years in Turkey is 97.4% for primary school, 94% for junior high school, and 75.36% for secondary education. These data suggest that our cohort had lower education rates than the general population in terms of attending junior high ($p = .02$) and secondary education ($p < .0001$; Table 2).

The most commonly identified psychiatric disorders were social phobia (75%) and attention deficit and hyperactivity disorder (ADHD) (75%). Social phobia and ADHD will be found in 7% and 2.5% of the population, respectively. In our patient group, 12 patients (75%) had social phobia and 12 patients had ADHD (75%), significantly greater than the rates in the normal population ($p < .0001$ for both). Most psychiatric disorders were also present at significantly greater rates than those in the normal population (Table 3).

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