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Frozen shoulder and the Big Five personality traits

Philippe Debeer, MD, PhD[a,*], Fien Franssens[b], Isabelle Roosen[b], Wim Dankaerts, PhD[b], Laurence Claes, PhD[c]

[a]*Orthopedics, University Hospitals Leuven & Department of Development and Regeneration, KU Leuven, Pellenberg, Belgium*

[b]*Musculoskeletal Research Unit, Department of Rehabilitation Sciences, Faculty of Kinesiology and Rehabilitation Sciences, KU Leuven, Leuven, Belgium*

[c]*Faculty of Psychology and Educational Sciences, KU Leuven, Leuven, Belgium*

Background: In the past, several studies have suggested the existence of a ''periarthritic personality'' in patients with frozen shoulder. We conducted a study to determine differences in personality traits in patients with primary and secondary frozen shoulders.

Materials and methods: We prospectively evaluated 118 patients (84 women and 34 men; mean age, 53.8 years; SD 7.56) with a frozen shoulder. Of these patients, 48 had an idiopathic frozen shoulder and 70 had a secondary frozen shoulder. Personality traits were determined by the NEO Five-Factor Inventory (NEO-FFI) scale. This questionnaire measures the 5 major personality traits and is based on the norms determined in a neutral test situation for 2415 controls.

Results: Compared with healthy controls, no differences in personality traits were found in patients with primary and secondary frozen shoulder, except for Conscientiousness and Extraversion, for which patients with secondary frozen shoulder scored significantly higher than healthy controls. Patients with primary frozen shoulder scored significantly higher on Openness to Experience than did patients with secondary frozen shoulder; on the other 4 Big Five personality traits, no significant differences were found between patients with primary and secondary frozen shoulder. More specifically, patients with idiopathic frozen shoulder did not score higher on the trait Neuroticism as would be expected from previous publications.

Conclusions: Our study results do not indicate that patients with an idiopathic frozen shoulder have a specific personality compared with healthy controls. Only a few differences were found in personality traits when the entire frozen shoulder group was compared with healthy controls and between patients with primary and secondary frozen shoulders. The results of this study suggest that these differences are not sufficient to speak about a specific ''frozen shoulder personality.''

Level of evidence: Level III, Cross-Sectional Design, Epidemiology Study.

Keywords: Personality; Big Five personality traits; NEO-FFI; primary frozen shoulder; secondary frozen shoulder

This study was approved by the Full Local Research and Ethical Committee of the University Hospital Leuven (B32220097078 S51884).

*Reprint requests: Philippe Debeer, MD, PhD, Orthopedics, University Hospitals Leuven & Department of Development and Regeneration, KU Leuven, Weligerveld 1, B-3212 Pellenberg, Belgium.

E-mail address: philippe.debeer@uzleuven.be (P. Debeer).

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Frozen shoulder is a common, disabling condition associated with synovitis and capsular contracture of the glenohumeral joint. The classic definition of a frozen shoulder is a shoulder with limitation of both active and passive range of motion. The condition can be primary (or idiopathic), meaning that the etiology is unknown. It can also be secondary, indicating that a specific cause can be identified.[16]

Apart from these classic causes of frozen shoulder, clinicians often have the impression that a frozen shoulder is frequently seen in patients with a specific personality.[4,6,8,11,12] In contrast, other researchers found no psychological differences. Wright and Haq[15] showed that psychological factors were of little importance in the causation of frozen shoulder. They assumed that the development of a stiff shoulder was due to an interrelationship of many factors, mainly age. On the basis of these studies, there is still uncertainty about the association between personality characteristics and frozen shoulder.

The current study was conducted to further investigate a possible relationship between frozen shoulder and personality with use of the Dutch version of the Neuroticism–Extraversion–Openness to New Experience Five-Factor Inventory (NEO-FFI).[5] The NEO-FFI assesses the Big Five personality traits: Neuroticism, Extraversion, Openness, Altruism, and Conscientiousness. In psychology, the Big Five personality traits are 5 broad domains or dimensions of personality that are used to describe human personality.

We wanted to investigate whether there is a difference in personality profile between patients with an idiopathic frozen shoulder and healthy controls and evaluate differences in personality traits between patients with secondary frozen shoulders and healthy controls and between patients with an idiopathic frozen shoulder and those with a secondary frozen shoulder. We hypothesized that persons with an idiopathic frozen shoulder would score higher on the trait Neuroticism (emotional instability) compared with healthy controls and that patients with a secondary frozen shoulder would show no differences in personality compared with a healthy control population because a clear etiology is present in these cases. Finally, we hypothesized that patients with an idiopathic frozen shoulder would score higher on the trait Neuroticism compared with those with secondary frozen shoulders (systemic and nonsystemic).

Methods

We recruited 118 consecutive patients, 84 women and 34 men with a mean age of 53.88 years (SD = 7.56; range, 28 to 74 years), who presented to our Orthopaedic Upper Limb Clinic with a frozen shoulder for more than 6 months between December 2009 and May 2012. Participants provided written informed consent before inclusion in our study.

Assessments and instruments

The diagnosis of frozen shoulder was made on clinical grounds: marked loss of active and passive glenohumeral motion with severe restriction of external rotation, abduction, and forward flexion. Active and passive range of motion was measured with a handheld goniometer with the patient in the standing position. Forward flexion and abduction were evaluated by measurement of the angle formed by the arm and thorax. External rotation was measured with the arm adducted and the elbow at the side and flexed to 90°. Internal rotation of the arm behind the back was determined by the vertebral level that could be reached by the dorsum of the hand. After enrollment in the study, patients were divided into the primary frozen shoulder group and the secondary frozen shoulder group by the criteria of Zuckerman.[16] In patients with a primary frozen shoulder, no underlying cause or associated condition could be identified. In secondary types of frozen shoulders, a clear cause or associated condition could be identified, and this group was further subdivided into 3 categories: systemic, nonsystemic intrinsic, and nonsystemic extrinsic. Systemic causes of frozen shoulder included diabetes mellitus, thyroid disease (hypothyroidism and hyperthyroidism) and hypoadrenalism, and any other condition that has been documented to have an association with the development of frozen shoulder (e.g., hyperlipidemia and Dupuytren's disease[3,14]). Nonsystemic secondary frozen shoulders can be divided into intrinsic and extrinsic frozen shoulders. Intrinsic secondary frozen shoulders include all frozen shoulders associated with rotator cuff disease (e.g., tears, calcifications, tendinitis) and biceps disease (secondary intrinsic frozen shoulder). Extrinsic secondary frozen shoulders are those associated with an abnormality remote from the shoulder (e.g., cerebrovascular accident, pulmonary disease, cardiac disease, cervical radiculopathy, chest wall tumors, ipsilateral breast interventions) or more local problems in the shoulder joint (e.g., humeral shaft fractures, acromioclavicular problems, clavicle fracture).

On the basis of a questionnaire and available medical records, patients were classified as having a primary frozen shoulder when no underlying cause or associated condition could be identified. All patients with a clear cause were subdivided into the secondary frozen shoulder group. This group was further subdivided into the systemic group and the nonsystemic group (Fig. 1). Because we did not perform biochemical analyses in all patients, the existence of diabetes, thyroid disease, or hyperlipidemia was based on the current drug treatment of the patients. All patients had standard radiography of the shoulder to detect the presence of calcifications, malunions, fractures, and signs of glenohumeral arthritis. Ultrasound and magnetic resonance imaging were used to evaluate the integrity of the rotator cuff and the biceps tendon and to detect any calcifications.

Exclusion criteria for this study were stiffness caused by glenohumeral arthritis, stiff shoulders after shoulder arthroplasty, reflex sympathetic dystrophy of the ipsilateral hand, malignant neoplasms of the shoulder girdle, and mental incapacity to fill in the questionnaire.

Personality traits were assessed by means of the Dutch version of the NEO-FFI.[5,9] This scale assesses 5 major personality traits: Neuroticism, Extraversion, Openness, Altruism, and Conscientiousness. The different personality traits and their characteristics are described in Table I. The NEO-FFI consists of 60 items and measures the 5 major personality traits (12 items for each trait). Items are answered on a 5-point scale ranging from *strongly disagree* to *strongly agree*. It takes 10 to 20 minutes to finish the NEO-FFI, and norms for the population are available. The patients filled in the pen and paper version of the NEO-FFI