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Original Article

The level and influencing factors of quality of life in patients with brachial plexus injury

Jie Shen^a, Zhi-Wen Wang^{b,*}^aDepartment of Hand Surgery, Beijing Jishuitan Hospital, Beijing, China^bSchool of Nursing, Peking University, Beijing, China

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ABSTRACT

Purpose: To investigate the overall quality of life level and identify influencing factors in patients with traumatic brachial plexus injury.

Methods: One hundred three patients with brachial plexus injury were assessed using the World Health Organization Quality of Life-BREF (WHOQOL-BREF) and Family Adaptability and Cohesion Evaluation Scale (FACESII-CV) questionnaires.

Results: The overall quality of life score from patients with brachial plexus injury was 65.78 ± 15.2 . The scores for the physical, psychological and environmental factors were significantly lower than the norm ($P_s < 0.05$). Regression analysis showed that age, injury located ipsilateral to the dominant hand, upper limb function score, score of family intimacy and family income were all factors influencing the of quality of life.

Conclusions: A brachial plexus injury significantly compromises an individual's quality of life. Multiple factors influence this quality, which should be targeted to augment the physical and psychological care provided.

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1. Introduction

Injury to the brachial plexus, composed of five to eight cervical nerves and the first thoracic nerve anterior branch [1], is difficult to treat. Brachial plexus injuries can often lead to severe upper limb dysfunction and permanent disability of patients,

with serious social and economic impacts [2]. Treatment and rehabilitation for these injuries take longer than for other peripheral nerve injuries, and it is these interventions that can influence the patients' quality of life [3]. The aim of the present study was to assess the quality of life in patients with brachial plexus injuries. Furthermore, possible contributing factors

* Corresponding author.

E-mail address: wzwjing@sina.com (Z.-W. Wang).

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were assessed in an effort to identify key components that can be targeted in the future for treating individuals with these injuries and improve their quality of life.

2. Design and methods

2.1. Subjects

Patients hospitalized in the Beijing Jishuitan Hospital with brachial plexus injury between June 2012 and February 2013 were recruited for this study. Criteria for inclusion were: over 18 years of age, diagnosis for traumatic brachial plexus injury, at least one prior operation, admission was at least one month from last operation, voluntary participation. Patients were excluded from the study if they had other chronic diseases, mental illness or severe mental disorder, or a non-traumatic brachial plexus injury.

2.2. Surveys

Upon admittance to the hospital for surgery, informed consent was obtained from the patients who were then asked to complete a four-part questionnaire that included general information and questions from the Disabilities of the Arm, Shoulder and Hand (DASH) survey [4], the World Health Organization Quality of Life BREF (WHOQOL-BREF) [5] assessment and the Family Adaptability and Cohesion Evaluation Scale (FACESII-CV) [6]. For patients unable to fill out the survey, questions and possible answers were read to them, and their oral answers were recorded. A total of 103 questionnaires were distributed, and 103 valid questionnaires were returned, yielding a 100% effective rate.

2.2.1. General information

The first part of the questionnaire concerned demographics and medical history information, including: gender, age, occupation, education level, marital status, family income, medical expenses, payment methods, causes of injury, time from the initial injury, the number of operations, time from the most recent operation, participation in functional exercise training, whether the injury occurred ipsilateral to the dominant hand, etc.

2.2.2. DASH survey

The DASH survey is a 30-item, self-report questionnaire designed to measure physical function and symptoms in individuals with musculoskeletal disorders of the upper limbs. It provides clinicians and researchers the advantage of a single, reliable method to assess any or all joints in the upper extremities. Scoring involves rating the difficulty of each item on a level from one to five: no difficulty (1 point), somewhat difficult (2 points), medium difficulty but it can be done (3 points), very difficult (4 points), cannot do (5 points). The DASH value is then calculated as: (sum of all scores – 30)/1.20, where a score of 0 represents normal upper limb function, and a score of 100 indicates extremely limited upper limb function.

2.2.3. WHOQOL-BREF assessment

This survey involves a total of 26 questions concerning physical, psychological, social, and environmental factors rated on a scale

of 1–5. Each entry is analyzed according to both the quality of life and overall health. Scores in each of the four categories range from 4 to 20 points, and are summed and converted into a percent score. A higher score indicates better quality of life.

2.2.4. FACESII-CV

The FACESII-CV is a scale from the 1991 Phillips et al. amendments, mainly based on the Olson cyclic model theory, with 30 entries (scored from 1 to 5) encompassing two dimensions to evaluate family function: family cohesion (total of 12–88 points) and adaptability (total of 14–70 points) [7]. The dimension of family cohesion concerns intimacy, or emotional connection, between family members living together in time and space, their hobbies or entertainment and other aspects of consistency, such as household decision-making methods. The dimension of adaptability refers to the responses of the family to external environmental pressures, such as a change in its power structure or role assignment as a result of marriage or family development. The scale is designed to assess levels of family pride and satisfaction, consultation and cooperation among family members, and problem-solving skills within the family.

2.3. Statistical analysis

Data were analyzed using Student's *t*-test, analysis of variance, correlational and multiple regression analyses on SPSS17.0 software (SPSS Inc., Chicago, IL, USA). Data are presented as mean \pm standard deviation, and a *P* value of 0.05 was used to determine significance.

3. Results

3.1. Patient characteristics and overall quality of life scores

Questionnaire results were obtained from a total of 103 patients between 19 and 55 years of age (30.05 ± 10.02 y) with brachial plexus injuries. The average DASH score of upper limb function was 41.43 ± 15.86 points (range: 14.17–72.50). The average family cohesion score was 64.06 ± 10.39 points (range: 43–81), and the average family adaptability score was 43.25 ± 7.05 points (range: 28–54). The overall quality of life in patients was an average 78 ± 15.24 points. Scores for each of the four WHOQOL-BREF categories are shown in Table 1. Patients with brachial plexus injuries had significantly lower physical, psychological and environmental qualities of life compared to the norm ($p < 0.05$).

Table 1 – Quality of life score of brachial plexus injury patients compared with the national norm [5] (mean \pm standard deviation).

Domain	Patients	Norm	<i>t</i>	<i>p</i>
Physical	11.77 \pm 3.01	15.80	–13.573	0.000
Psychological	9.83 \pm 3.04	14.30	–14.920	0.000
Social	13.14 \pm 3.70	13.70	–1.539	0.127
Environmental	12.52 \pm 2.84	13.20	–2.415	0.017

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