

# The effect of different types of cortisol secretion on the prognosis of lumbar discectomy

Research Article

Chong-Nan Yan<sup>1</sup>, Huan Wang<sup>1,\*</sup>, Miao Peng<sup>2</sup>, Shao-Qian Cui<sup>1</sup>, Hai-Lun Gu<sup>1</sup>

<sup>1</sup>Spine and Trauma Orthopedic Ward,  
Shengjing Hospital affiliated to China Medical University,  
110004 Shenyang, China

<sup>2</sup>Psychological Outpatient Service,  
Shengjing Hospital affiliated to China Medical University,  
110004 Shenyang, China

Received 30 October 2012; Accepted 06 May 2013

**Abstract:** Background: The purpose of this study was to investigate saliva cortisol levels of Chinese patients with discogenic sciatica and to clarify the relationship between psychosocial factors and saliva cortisol levels. We also intended to elucidate the effect of different types of cortisol secretion on the prognosis of lumbar discectomy. Methodology: 37 patients with discogenic sciatica, 18 patients with chronic somatic pain and 20 healthy pain-free subjects were included in this analysis. The Japanese Orthopedic Association (JOA) score was used to evaluate functional ability. The diurnal patterns of cortisol secretion of the three groups were assessed. The correlation between cortisol secretion level and preoperative psychosocial surveys was assessed. Results: The patients with chronic somatic pain showed a significantly low level of cortisol secretion during the declining period and an obvious decline from the peak. The change in JOA score after surgery was positively correlated with saliva cortisol concentration during the peak period and the declining period, and negatively correlated with the magnitude of cortisol change throughout the day. Psychosocial factors were correlated with improved JOA scores. These factors are also interrelated to the cortisol secretion level. Conclusions: Cortisol secretion level is a correlative physiological mechanism for the effect of psychosocial factors on the prognosis of lumbar discectomy.

**Keywords:** Cortisol secretion type • Psychosocial factor • Saliva

© Versita Sp. z o.o.

## 1. Introduction

Lumbar discectomy is one of the most common treatments for lumbocrural pain caused by lumbar disc herniation. Outcomes after lumbar discectomy continue to improve as indication for surgery and surgical techniques improve. Despite the general success of the surgery, some patients continue to experience long-term lumbocrural pain, even when reduced nerve pressure has been confirmed by intraoperative observation and postoperative imaging. Surgical efficacy ranges between 60% and 90% and is dependent in the metrics used to measure success [1-4]. Persistent post-operative pain, severe impairments with activities of daily living and inability to work are the most common factors underlying patient-reported dissatisfaction with surgery.

Persistent postoperative pain is one of the most common impairments following surgery. Some researchers have suggested that chronic lumbocrural pain is affected by psychological stress, pathological behaviors, and attitude towards general pain and disability, which may result in different patterns of pain response among patients with similar pathology [5]. Pain is a subjective sensation and a complex psychophysiological phenomenon, making the individual interpretation of pain and the associated damage inconsistent between patients [6,7]. Depressed patients are prone to fear and negative responses to pain [8] and these patients are prone to catastrophizing their pain experience, which leads to a voluntary reduction in daily activities and reduced work-related activities. This can occur even when the actual pain is not of a magnitude that

\* E-mail: wanghuan20111105@hotmail.com