Biomechanical Evaluation of Normal Hand in Indian Adult Population

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ABSTRACT *Aims & objectives :* To find out the biometric hand values of normal and affected hands in Indian anthropometric perspective in patients treated in a tertiary referral centre.

Material and methods : Biometric evaluation data of normal hands of 349 patients presented to our centre is analysed statistically to find out the biometric hand values of normal in Indian anthropometric perspective. We used E-Link Biometrics® modular system and data was analysed by SPSS software® Version 17 with help of Biostatistics department.

Results : Normal value of hand grip with respect to various positions, sex and hand dominance are found which corresponds to value that are previously found from studies with small sample sizes.

Introduction

One of the function of upper extremity is to manipulate the environ ent using the motor power. This function is measured clinically by testing the motor power of muscles(S. Namkung) and objectively by grip power (Andersen Hammond, Shay, & Szturm, 2009).There are very few data bank for the objective assessment of hand grip in Indian healthy adult perspective(Bhardwaj, Nayak, Kiswar, & Sabapathy, 2011; De, Debnath, Dey, & Nagchaudhuri, 1980; Koley & Singh, 2009). In this article we tried to find out the biomechanical values of normal in an Indian anthropometric perspective.

Material and methods

We evaluated Biomechanical data collected from normal and affected hands of 349 adults (18-60) patients presented to our centre between 2010 and 2015. Our centre receives patients all over India and the group can be representative of Indian population. The biomechanical data was collected at the time of presentation from normal and affected hands at the initial visit. This data is analysed statistically to find out the biometric hand values of normal in Indian anthropometric perspective. We used E-Link Biometrics®, UK modular system for data accusation. The position 2 of the Dynamometer is used to collect the maximum grip power.(Trampisch, Franke, Jedamzik, Hinrichs, & Platen, 2012) We used SPSS software® Version 17 with help of Biostatistics department for statistical analysis.

Results

There were 349 patients with 281 normal hands and 417 affected hands. The power parameters were collected from the 281 normal hands which are given in the following tables and graphs. Right hand dominance was found to 98.28% in over all cases which is similar in males(98.31%) and females (98.11%).

Table 1. Average grip power in position 2 of normal hand (n=349)

	Right	Left
Male	37.86 Kg	34.50 Kg
Female	23.50 Kg	22.53 Kg
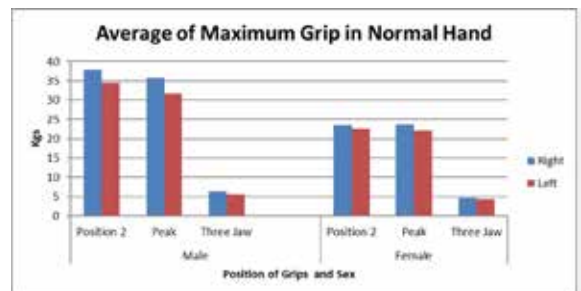
Graph 1 Showing Average of Maximum Grip in Normal Hand with respective to positions and Sex

Table 2 Maximum Power of Normal Dominant Hand (Position 2) in Kilograms

	Right	Left
Male	55.7	61.1
Female	33.9	38.4

Discussion

Right hand dominance is the norm for hand dominance in Indians although the maximum power was found to be more in left hand of left hand dominant than that of right hand of a right- hand dominant. Our data correspondence to similar but with very small sample size studies.(Bhardwaj et al., 2011)

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