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Evaluating the Results of Rounded Shoulders without Previous Symptoms and their Relationship with Static and Dynamic Basic Balance

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Abstract: This study aimed to Evaluating the results of rounded shoulders without previous symptoms and their relationship with static and dynamic basic balance where A cross-sectional study was conducted on a specific group of samples of athletes in Najaf Governorate - Iraq, where 70 samples were collected and distributed into two groups (40 athletes included the samples who suffer from Rounded shoulders without previous symptoms 30 samples included the healthy comparison group. This study was designed to gather a specific group and apply the necessary tests to achieve the goal where The cases were evaluated according to specific standards to find out the negative and positive effects. The athletes were tested according to Quick DASH Score and Quick DASH Score and The samples were also analysed according to the statistical analysis program Microsoft Excel and SPSS Soft 22:0 In this study, a positive relationship was found between the patient group and the results of static and dynamic balance in the results of rounded shoulders without previous symptoms. One of the primary risk factors to consider is the development of glenohumeral instability. This condition can arise from traumatic events that result in structural damage to the shoulder or from an inherent deficiency of passive and active shoulder stabilizers. Furthermore, engaging in contact sports and experiencing an increase in tissue elasticity, known as hyperlaxity, can predispose individuals to anterior shoulder instability. It is worth noting that these risk factors may vary depending on the specific condition and individual circumstances.

Keywords: Rounded, shoulders, symptoms,BMI, tissue, instability.

INTRODUCTION

Shoulder tendonitis is a common cause of shoulder pain and stiffness. When the rotator cuff - the muscle that keeps the shoulder stable and the biceps tendon - becomes inflamed and irritated, will experience shoulder pain and stiffness. This is known as shoulder tendonitis. It indicates inflammation in a specific area within the shoulder joint [Hess, S. A, 2000; Magee, D. J, 1998].

Rounded shoulders have been found to have a relationship with both static and dynamic balance. Several studies have investigated this relationship and found significant correlations. One study found that participants with rounded shoulders showed improvements in static balance after performing shoulder stabilization and stretching exercises [Curl, L. A. *et al*., 1996; Sahrmann, S. A, 2002]. Another study compared different exercise programs and found that foam roller exercises were the most effective in improving shoulder height, which is related to rounded shoulders [Greenfield, B, 2001]. Additionally, a study on sedentary female college students found weak correlations between dynamic balance and lower leg length and body mass index [Lukasiewicz, A. C. *et al*., 1999]. Finally, a study on young adults found weak to moderate correlations between various static and dynamic measures of balance, suggesting that there may be underlying features of a general balance ability[Singla, D. *et al*., 2017; Szczygieł, E. *et al*., 2015].

These findings suggest that rounded shoulders can impact both static and dynamic balance, and that targeted exercises and anthropometric characteristics may play a role in improving balance [Bassey, E. J. *et al*., 1993].

The extent of rounded shoulders can impact the static and dynamic balance of individuals. Kim *et al*.'s study discovered that a combination of shoulder strengthening exercises and pectoralis minor stretching enhanced the static and dynamic balance and muscular strength of young adults with rounded shoulder posture .A study carried out by Wong *et al*. revealed that soft tissue mobilisation and self-stretching of the pectoralis minor led to a significant reduction in rounded shoulder posture among healthy participants [Curtis, G. L. *et al*., 2017]. Further, Liaw *et al*. showed that elderly participants experienced a higher degree of postural imbalance and relied more heavily on hip strategies to maintain equilibrium, particularly on a swaying support surface [Armstrong, S. *et al*., 2007]. Addressing rounded shoulder posture through exercises and mobilization techniques appears to enhance balance. Additionally, various factors, including hip strategy and sensory input, may influence age-related changes in balance[Jung, S. I. *et al*., 2016; Erdem, E. *et al*., 2020].

Rounded shoulders without previous symptoms can be found in an asymptomatic population, where 69% of participants demonstrated some

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abnormal shoulder scores [Jacobs, K. *et al*., 2009; Ruivo, R. M. *et al*., 2014].

The best possible shoulder score in this population may not be equivalent to a perfect score on the outcome scale .

Treatment aimed at the pectoralis minor muscle, such as soft tissue mobilization and self-stretching, can significantly reduce rounded shoulder posture [3]. In pathology-free individuals, there is no difference in patient-reported outcome measure (PROM) values when considering sex, age, ethnicity, and geographical location .However, poorer PROM values are associated with a history of an inactive shoulder problem and increasing age where Female participants tend to report similar or poorer PROM scores[Greenfield, B. *et al*., 1995] . Geographical location is associated with differences in some shoulder scores, but not others.

METHOD

70 Iraqi citizen volunteers, aged 18 to 29 years and without a history of shoulder pain, participated in this study. Individuals with neurological or systemic diseases, such as rheumatoid arthritis, were excluded. All participants underwent ultrasound examination to differentiate healthy shoulders. A sports doctor with over 7 years of experience assessed the level of pain in the samples. As a result, the participants were divided into two groups: the control group consisting of 40 samples and the patient group consisting of 50 samples.

Ultrasound studies were used to distinguish healthy and asymptomatic shoulders. A sports medicine physician evaluated participants' shoulders using SonoSite M-Turbo, L38e. Ultrasonography can detect cuff pathology and tear, with healthy shoulders having an intact rotator cuff and tear-prone shoulders. This method is comparable to MRI.

Fig 1: SonoSite M-Turbo

In this study, a questionnaire was developed to assess the quality of life and pain levels. The Quick-DASH measure was also discussed and compared to a second group to determine statistical differences between the two groups. Joint range of motion can be measured actively or passively. Passive range of motion (PROM) measures the movement in a joint when an external force is applied. Active range of motion (AROM) measures the motion achieved when the patient contracts the relevant muscles. Trauma or disease can limit joint movement and affect occupational performance.

There are two additional types of ROM: self-controlled range of motion (SROM) and assisted range of motion Active movement (AAROM). In SROM, the patient uses the unaffected side to perform ROM on the affected side. In AAROM, the therapist, patient, or caregiver provides support during active movement, allowing the patient to exceed the limits of the current AROM. These techniques can be beneficial in rehabilitation and should be considered as part of the treatment plan.

The reliability, validity, sensitivity, and objectivity of these tests have been studied, with intra-session reliability generally higher than inter-session reliability. However, there is a lack of reports on inter-tester and intra-tester reliability for some tests, especially those performed on an unstable surface.

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Balance tests used to assess static and dynamic stability include the Star Excursion Balance Test (SEBT) and the Y Balance Test (YBT) (Hess, S. A. 2000). Additional tests mentioned in the abstracts encompass one-leg jump landings, Posturomed perturbations, simulated forward falls, Balance Error Scoring System (BESS), clinical balance tests, functional reach, and outstep tests (Magee, D. J. 1998; Curl, L. A. and Warren, R. F. 1996 and Sahrmann, S. A. 2002). These tests evaluate various aspects of balance, such as proprioception, joint position reproduction, postural control, and stability during hand function (Greenfield, B. 2000). The metrics employed to evaluate these tests encompass time to stabilization, margin of stability, COP path length, COP excursion, speed of COP change, mean amplitude of COP sway, and standard deviation of forces and COP changes.

RESULTS

Table 1: general characteristics of study

	Patients N=40	**Control,N=30**	**P value**
Age			
18-20	20	15	
21-23	10	7	<0.01
24-26	7	4	
27-29	3	4	
BMI	23±3.3	22±1.1	0.932
Dominant arm			
Right	25	20	0.938
Left	15	10	0.32
Height of arm	1.01 ± 0.004	1.011 ± 0.005	0.55
ASES Score	88.1±8.8	100.1 ± 10.2	0.77

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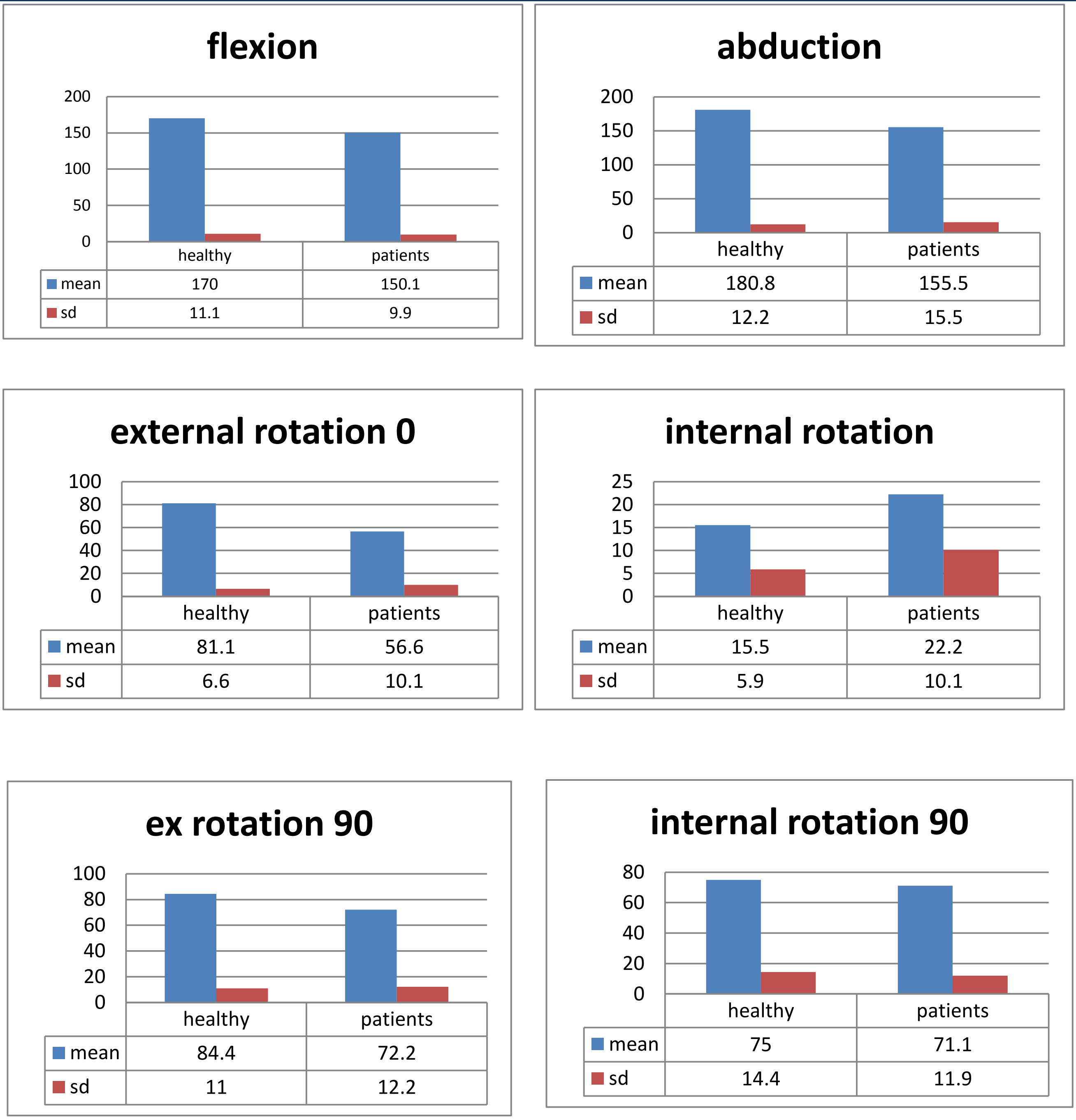

Figure 1: Assessment outcomes according to Range of motion

Table 2: assessment outcomes of sample according to logistic analysis

Variable	Odds Ratio(95% CI)	P value
Internal Rotation 0	1.4(0.9-2.8)	0.8327
External Rotation 90	2.7(1.5-4.4)	<0.01
Internal Rotation 90	3.1(2.2-6.6)	0.001
ASES Score	1.34(0.89-1.98)	0.0393

Table 3: outcomes of sample according to Quick DASH Score

Variable	Patients , N=40	Sample,N=30	P value
Excellent (0-5 degree)	0	5	0.001
Good(6-15 degree)	5	20	<0.01
Satisfactory (15-35 degree)	29	5	0.003234
poor(>35)	11	0	0.0001

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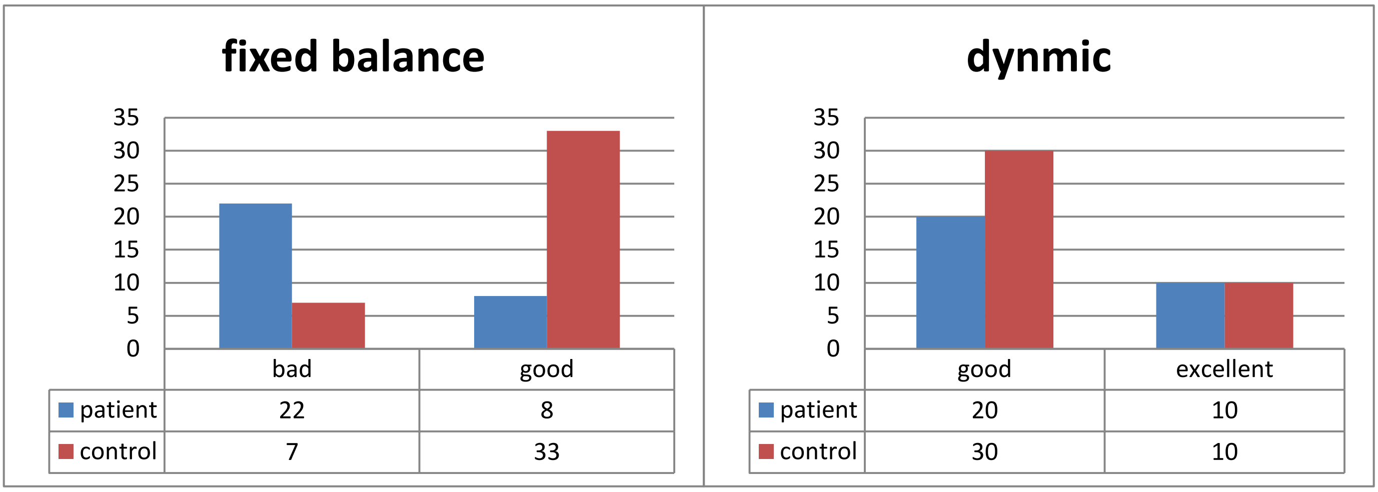

Figure 2: Results related to fixed balance against dynamic balance

DISCUSSION

Dynamic balance is crucial for maintaining stability and safety while performing various movements. It is essential for walking and other daily activities. Any disruption to this balance can greatly impact our independence. Good dynamic balance enables us to navigate our surroundings without colliding with objects or individuals, and prevents falls. Without it, maintaining physical activity becomes challenging, which can negatively affect our overall health. Therefore, it is important to prioritize and improve dynamic balance to ensure a safe and active lifestyle [Borstad, J. D. *et al*., 2005]

Dynamic equilibrium encompasses the intricate interplay between an individual's locomotion and their surrounding environment. Conversely, static equilibrium pertains to the remarkable ability to maintain an upright and unwavering posture without any external displacement. It is worth noting that static balance serves as a fundamental pillar for an individual's overall equilibrium, thereby playing a pivotal role in their physical stability. The absence of a robust static balance poses a formidable challenge when attempting to execute more intricate movements or partake in physical endeavors. It is imperative, therefore, to place equal emphasis on cultivating and preserving both dynamic and static equilibrium in order to optimize one's autonomy in daily activities. By dedicating attention to the development and maintenance of these two types of balance, one can significantly augment their overall functionality and mobility [Borstad, J. D, 2006; Wang, C. H. *et al*., 1999; DiVeta, J. *et al*., 1990].

According to the graph depicting the comparison between static balance and basic dynamic balance, it is evident that within the test patient group, 22 individuals exhibited "bad" static balance, while 8 individuals demonstrated regular static balance, as per the test rating scale. In terms of dynamic balance, 10 of the injured athletes who underwent the test displayed "excellent" dynamic balance, whereas 20 athletes were rated within the "good" range. It is imperative to note these findings and consider their implications when assessing balance in patients or athletes.

CONCLUSION

The present investigation was carried out on a group of 90 athletes in Najaf Governorate, Iraq, whose ages ranged from 18 to 29 years. The findings of this study indicate that the participants' performance in static balance predominantly fell within the lower end of the spectrum, indicating a poor level of proficiency. Conversely, when it came to dynamic balance, the sample demonstrated an exceptional level of skill, as evidenced by their classification in the excellent range. These results suggest that the athletes' ability to maintain equilibrium while in motion is more advanced compared to their ability to maintain stability while stationary.

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