

Playing related Musculoskeletal disorders in Guitarists

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Abstract: Work-related musculoskeletal disorders cause pain, disability and loss of employment for many workers, including musicians. Although performing arts medicine is a growing field, the health problems of musicians remain under-recognized and under-researched. 100 Guitarists were evaluated through a validated questionnaire and various outcomes measures evaluated were disabilities of arm, shoulder and hand (DASH, performance Arts module), Neck disability Index (NDI), Wrist/ Hand disability (WHD) and Oswestry disability Index (ODI). There was extremely significant difference between the scores of all outcome measures. DASH score > ODI > NDI > WHD (P-value < 0.0001, denotes extremely significant). PRMSD were prominent in the guitarists. They were affected with disabilities of Upper extremity, low back and neck.

Key words: Guitarists, Musculoskeletal disorders

1 Introduction

Musicians, like athletes, are prone to musculoskeletal injuries. These injuries can end a career or affect the individual's earning potential, but a successful return to musical activity can usually be achieved following appropriate treatment. Research shows that musicians are at risk for developing occupational disorders. Long hours spent sitting or standing in the same position, quick, complex, repetitive movements, and the stress of performance are potential dangers common to the workplace of all instrumentalists. Studies put the prevalence of Playing-Related Musculoskeletal Disorders (PRMD) at between 39% to 89% (Zaza, 1998)[1]; even young music students and amateur players have been shown to be at risk (Buckholder, 2004; Morse, 2000; Ranelli, 2008)[2,3]. The number of instrumentalists with playing related illness who actually seek medical help is estimated to be as low as 15%, meaning that rates of illness may in fact be much higher (Buckholder, 2004)[2]

Hand and wrist injuries are particularly common in performers, especially pianists and string players. (Ranelli 2008, Manchester 1991)[3,4] Most of a musician's work is performed by the upper limbs, so the shoulders, elbows, wrists and hands are the most frequently affected site of symptoms, at incidences of 18%, 9% and 9%, respectively. (Dawson 1988)[5] The prevalence of musculoskeletal disorders in instrumentalists is relatively high, ranging from 73.4% to 87.7%. Thus the aim of our study is to identify PRMSD in guitarists.

2 Material & Methodology

100 Guitarists were evaluated through a validated questionnaire and various outcomes



measures evaluated were disabilities of arm, shoulder and hand (DASH, performance Arts module), Neck disability Index (NDI), Wrist/ Hand disability (WHD) and Oswestry disability Index (ODI). Kruskal –Wallis Non-Parametric ANOVA was performed to analyse the data.

3 Result & observation

Table 1: Mean Scores of DASH,NDI,WHD&ODI in Guitarists

Group	Sum of Ranks	Mean of Ranks
DASH	2752	91.73
NDI	1489	49.63
WHD	1403	46.76
ODI	1616	53.86
KW=32.998,P value< 0.0001 Extremely significant		

Table 2: Scores of DASH,NDI,WHD&ODI(Median,Minimum and Maximum)

Group	Median	Minimum	Maximum
DASH	50	25	75
NDI	31	20	60
WHD	28	14	52
ODI	34	20	52

KW test: Non parametric ANOVA,P value<0.0001 which denotes Extremely significant
 Frequency of playing: 36% played thrice in a week, 32% played everyday.43% played more than 15hours in a week.44.4 % did head banging.35% had pain at multiple sites.
 Commonly adopted posture was 57% were standing and 43% were sitting. In sitting posture 63% were without back support.

The prevalence of PRMSD was 78.5% and the wrist and hand problems were most common in the guitarists: 34.2%

The mean of ranks for DASH: 91.73, NDI: 49.63, WHD: 46.76 and ODI: 53.86 respectively.

There was extremely significant difference between the scores of all outcome measures.

DASH score>ODI>NDI>WHD (P-value <0.0001, denotes extremely significant).

4 Discussion

Research studies show that the most common problem is overuse, which is poorly defined but represents the culmination of playing past the point of muscle fatigue.(Lederman 2002)[6]

The most important factor is the constant repetition during intense practice sessions. Other risk factors include physical disproportion between instrument and musician, poor posture, fatigue, excessive finger angulation, increase in playing time and female gender.(Amadio 2003,Wilson 1991)[7,8]

This condition causes tissues to be stressed beyond their anatomical and physiological limits. Over 50% of professional musicians overuse their limbs with consequent pain.(Fry 1986)[9]

It occurs frequently in the forearm and hand, presenting as weakness, tingling, stiffness and lack of dexterity. There is usually minimal tenderness on examination.

There are many theories regarding aetiology of overuse syndrome. Amadio[7] proposed injury to muscles, tendons, joint capsules and ligaments as the cause.

Bengtson et al[10] studied five musicians with suspected overuse, without clinical evidence of inflammation, using pre- and post-exercise MRI; only one had any abnormalities, with a small area of non-specific T2 signal enhancement. To date, no definitive cause has been found.

A review of the literature indicates that nerve compression syndromes are common injuries among guitar players (Lederman 1986,2003).[11,12]

Shoulder complaints are common among instrumental athletes and typically result from prolonged static or dynamic loads. Hoppmann 2010[13] provides a summary of three common shoulder pathologies seen in instrumentalists: impingement, sub acromial/sub deltoid bursitis, and bicipital tendinitis.

Our findings Table 1&2 were similar to study done by Rigg et al[14],The study aimed to determine the most common anatomical location of pain and to identify possible etiological factors leading to injury. Of the respondents, 61.3% reported playing related pain; left hand and wrist (41.8%) was the most common location for pain; back and neck (17.2%) was the next most common location.

There was a correlation between players who suffered from problems of the left-hand and sitting or standing playing position; players who stand were more likely to have left hand and wrist injury. The authors speculate that this may be attributable to "extreme flexion of fretting wrist" by guitarists who tend to adjust their shoulder strap so the guitar sits too low. The authors conclude that their study "reflects that a substantial number of guitarists are experiencing playing related pain" (Rigg, 2003)

In another study the authors conclude an asymmetric playing position may affect the amount of musculoskeletal disorders in the upper-extremity and back" (Wahlström Edling, 2009)[15]

Thus, it is imperative to study the PRMSD in guitarists because of its high prevalence in string players (Dawson 2002)[16] and highest PRMSD found in Guitarists(Morse 2000)[17]

5 conclusions

PRMSD were prominent in the guitarists. There were affected with disabilities of Upper extremity, low back and neck

6. Clinical Implications

A comprehensive Biomechanical and Ergonomic assessment should be adopted to identify risks for early intervention and for prevention of chronicity in subjects suffering from PRMSD so appropriate treatment strategies can be implemented.



7. Recommendations

In the rehabilitation phase a programme of physical conditioning, including aerobic activity, parascapularstrengthening, postural exercises and core strength-ening, should be instituted as pain diminishes.

General treatment should include postural optimization, strengthening of shoulder and intrinsic hand muscles, endurance training over strength training in muscles with static demands, and modification of stretching exercises in patients with hypermobility. Intermittent splinting when appropriate is better to maintain conditioning than prolonged splinting.

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