Correlation of REBA with Spinal disability in Dental surgeons

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Abstract: Some musculoskeletal injuries occur at one specific moment; many more result from repeated strength demands coupled with lack of significant rest periods that together , exceed the tissue tolerance of an individual. Many difficult working postures of dental surgeons including rotation of cervical spine along with bending and rotation of lumbar spine with legs unsupported generate high static loads (increased muscle tension); which create musculoskeletal discomfort or fatigue in neck and back enduring muscles and induce work related injury among professionals. Thus need of this study requiring association of spinal disability and work related exposures. Dentists working in Navi Mumbai & Mumbai were included in the study. Subjects were assessed for REBA score, spinal disability were assessed using neck disability index (NDI) and Oswestry Low Back Pain Disability Questionnaire (OBDPQ).Correlation analysis were done for scores for these three tools. Results: 32% back pain and 35% neck pain incidence was noted. The biomechanical exposure analysed using REBA showed significant correlation with OBPDQ. This study suggests that, there was definite association with spinal disability with work related exposures in the study.

Key word: REBA, spinal disability, correlation

1 Introduction

Dentists spend long hours hunched over their patients with their arms raised and their hands positioned relative to their patients' mouths, unsupported stress is placed on the muscles of the lower back. ,Neck and shoulder area of the dentist. Occasional pains from irregular stances or positions are to be expected while they are performing static work (Kaul R et al 2015) However, when the pain becomes a regular occurrence, cumulative damage could arise leading to de-bilitating injuries(Frank Maurice Pitts 2005). When dentistry changed from a standing job to a sit down task, musculoskeletal pain in the neck and shoulder re-gion also became more prevalent. This leads to various Work related muscu-loskeletal disorders (WMSD).hence this study aims at correlating biomechanical risk exposure with disability level of spine

2 Methodology

Both male and female dental practitioners in the area of Mumbai & Navi Mumbai were included in the study. The study was approved by Institutional Ethics Committee, and

informed consent was obtained from all participants before the study. Subjects were asked to fill up their Demographic details like name, age, gender, dominance and other work details in the proforma.Sample size 250 was taken of which 129 were Institutional practitioners and 121 were Private Dental Practitioners. There were total of 116 males (46.4%) and 134 females (53.6%) who participated in the study. The subjects fulfilled the minimum criteria of BDS degree (100%). Out of this B.D.S (12%), M.D.S (56%) and rest were pursing post-graduation (32%).

Activity limitations due to back pain and neck pain were evaluated by Oswestry back pain Disability Questionnaire (OBPDQ) and Neck Disability Index (NDI) re-spectively.[Eda Tonga et al 2013] .analysis of biomechanical risk exposures were taken using REBA Score .correlation analysis were done using SPSS.

3. Result & observation

	NDI			OPDQS		
Male	Mean	Standard Deviation	Standard Error of Mean	Mean	Standard Deviation	Standard Error of Mean
In Male	4.45	3.88	0.54	10.88	10.56	1.87
PP Male	6.81	4.91	0.61	7.98	9.3	1.16
P value	0.098***			0.19#		
In Female	3.65	2.03	0.23	6.12	8.32	0.94
PP Female	9.9	4.4	0.59	6.98	9.94	1.3
P value	0.023***			0.723#		

Table 1: showing incidence of various Cumulative Trauma Disorder in Institutional and Private Dental Practitioners

#Not significant, REBA- Rapid Entire Body Assessment, PP-Private Practitioners,

REBA		NDI	OBPDQ
In Male	Pearson Correlation	-2.55	0.46***
	Sig. (2-tailed)	0.071	0.007
PP Male	Pearson Correlation	-0.029	0.40***
	Sig. (2-tailed)	.89	0.009
In Female	Pearson Correlation	.099	.282
	Sig. (2-tailed)	.390	.021*
PP Female	Pearson Correlation	0.027	.35
	Sig. (2-tailed)	.84	0.0075***

IN-Institutionalised practitioners
Table 2: Correlation Matrix

4. Discussion

In our study, by using Mann-Whitney test there was no statistically significant difference noted in the values between Institutional and Private males and females. When REBA was correlated with Oswestry Back Pain Disability Questionnaire (OBPDQ) using Pearson correlation test, there was extremely significant correlation between them in all the groups (table 2) (p=0.007 for Institutional male subjects; p=0.009 for Private male practitioners) Also p=0.021 for Institutional female practitioners and p=0.0075 for private practitioners females were significant. No correlation of REBA observed with NDI.(TABLE 2) .score of neck disability shows statistically significant difference of NDI between institutionalized & private practitioners(male as well as female)(table 1) The dental working posture requires back to be erect all the time with awkward hand positions. The main risk factors associated with dental work are the sustained awkward postures and poor seating. Studies have shown that the seat moves almost every minute throughout a typical treatment session, as the clinician is continually adjusting their positioning to improve visual access and accommodate patient movement. Thus dental chairs should be capable of sustaining repeated stress. Our study observed that due to increased workload and reduced number of breaks; add up to the injuries. Less availability of free space for movement in Institutional subjects may lead to overuse injuries. In private practitioners; age and practicing years increases the incidence of pain. In a seated posture the pressure in the lumbar discs increases by 50% as compared to standing. Additionally, sitting in an unsupported posture can cause twice the amount of stress as compared to standing. During bending (forward flexion) and twisting (rotation) motions of the spine, the pressure on the lumbar discs increases by 200% (Fisk, 1987). This type of pressure on the disc can lead to a bulge or herniation, causing compression on a spinal nerve. All this factors accumulate to cause back pain and disc problems. Thus in an ideal situation, a clinician should be able to function from a height range where their thighs are parallel with the floor and the legs are in fully supported position (Sanders, 1997) to avoid postural problems(Ergonomics and dental Work) Also, our study observed that feet of the practitioner was unsupported on the floor most of the times.

5. Conclusions

32% back pain and 35% neck pain incidence was noted. The biomechanical exposure analysed using REBA showed significant correlation with OBPDQ. This study suggests that, there was definite association with spinal disability with work related exposures in the study.

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