



MUSCULOSKELETAL NECK PAIN AMONG CHILDREN AND ADOLESCENTS; RISK FACTORS AND COMPLICATIONS.

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ABSTRACT... Objectives: Neck pain is a frequent spinal pain problem and considered an important health issue in the modern world. Neck pain may originate from intervertebrals discs, ligaments, muscles or of the structures involving the neck. The aim of this study was to find out characteristics along with social and psychological implications of musculoskeletal neck pain amongst children aged 8 to 18 years. **Study Design:** Descriptive study. **Setting:** Orthopedic Department of Mayo Hospital, Lahore. **Period:** March 2017 to February 2018. **Material & Methods:** A total of 260 children and adolescents of both genders, aged 8 to 18 years and having musculoskeletal neck pain with spasm were enrolled in this study. A structured questionnaire was interviewed from participants or parents/guardians of this study. **Results:** Out of a total of 260 cases, there were 125 (48.1%) were boys and 135 (51.9%) girls. Most cases, 158 (60.8%) were between the age of 12 to 18 years while mean age amongst study participants was 14.58+2.63 years. Most of the children, 98 (37.7%) were studying in high school. All 260 cases had flawed flexion of back and neck during study and while using mobile phones or similar devices. Pain location involving neck was recorded in all 260 (100%) study participants while shoulder pain was demonstrated by 188 (72.3%). Most common eye symptoms were eye strain, in 64 (24.6%). Most of the cases, 180 (69.2%) were having irritability while poor communication was noted in 164 (63.1%). **Conclusion:** Musculoskeletal neck pain is frequent amongst children and adolescents. Hunching the head, neck and shoulders on mobile phones and similar devices, as well as improper posture during studying and watching television increase stress on cervical spine area, may be leading to musculoskeletal neck pain.

Key words: Eye Strain, Flexion, Irritability, Musculoskeletal Neck Pain.

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INTRODUCTION

Neck pain is the quite frequent spinal pain and considered an important health issue in the modern world.¹

Neck pain has been estimated to form around 40% of musculoskeletal problems amongst children and adolescents in a year's period.² Worldwide report involving 188 countries had neck pain ranked 4th highest contributor to worldwide disability.³

Neck pain may originate from intervertebrals discs, ligaments, muscles or of the structures involving the neck. It has also been seen that the majority don't seem to have any type of illness.⁴

Regarding epidemiology as well as treatment options of neck pain, lots of work has been documented amongst adults but data in pediatric population is scarce. Many researches from around the world have mentioned scarcity of data related to neck pain amongst the pediatric population.⁵⁻⁸

Those children who have continuous pain during their childhood or adolescents, have been shown to have chronic pain during their adulthood.^{9,10}

Most musculoskeletal disorders have been seen following a long term pattern in terms of their recurrence and remission and it has been evident that a new experience may turn out to be the repeat of a previous one.¹¹

An increase has been reported in the occurrence of musculoskeletal disorders involving children, there is a need to evaluate these condition more amongst this set of population.¹² A better understanding about the pattern and characteristics involved with the early inception is bound to provide us better handling of such cases. Data regarding musculoskeletal neck pain amongst children and adolescents is rare in Pakistan so the aim of this study was to find out characteristics along with social and psychological implications of musculoskeletal neck pain amongst children aged 8 to 18 years.

MATERIAL AND METHODS

This was a descriptive study conducted at Orthopedic Department of Mayo Hospital, Lahore, from March 2017 to February 2018. A total of 260 cases of both genders, aged 8 to 18 years and having musculoskeletal neck pain with spasm were enrolled in this study. All children or parents/guardians noting pain lined with congenital or systemic illnesses (like scoliosis), pain due to frank injuries (like fractures) or pain after any type of surgical procedures were not enrolled.

Informed consent was sought from the parents or guardians of all the study participants. Information like gender, age, education, usage of technology and habits were recorded on a predesigned proforma. General physical and radiographic examinations regarding neck pain were done in all the cases.

A structured questionnaire was interviewed from participants or parents/guardians of this study.

Cases were asked to locate the pain on them after providing a model. Chronic pain was labeled when there was a consistent neck complaints for > 6 months. Neurological evaluation was made to test the sensory as well as the motor deficits. Questions regarding daily habits, study condition, sitting patterns and sleeping postures were also asked. Usage of technology like mobile phones, tablets, computers, laptops and television were also queried.

All cases were asked to show their usual position while using mobile phones or tablets (if they were using), to note the angle of flexion. SPSS Version 20.0 was used for data analysis. Mean and standard deviation was calculated for age of the cases. Descriptive analysis was done analyzing and presenting data as frequencies and percentages.

RESULTS

Out of a total of 260 cases, there were 125 (48.1%) were boys and 135 (51.9%) girls. Mean age amongst study participants was 14.58 years with standard deviation of 2.63 years. Most of the children, 98 (37.7%) were studying in high school, 83 (31.9%) middle school or below while remaining 79 (30.4%) elementary school. None of the study participants were noted to have sensory or motor deficits.

All 260 cases had flawed flexion of back and neck during study. Likewise, all 260 cases were found to be using mobile phones or tablets. All cases were showing strong flexion of neck (more than 45°) while their usual position was noted during those activities. The study participants spent a mean duration of 132.64 minutes with standard deviation of 58.2 minutes with their mobile phones or similar devices.

Pain location involving neck was recorded in all 260 (100%) study participants while shoulder pain was demonstrated by 188 (72.3%), lower back 165 (63.5%) and arms 51 (19.6%). Eye symptoms revealed that 64 (24.6%) were having eye strain and 24 (9.2%) had dry eyes.

While analyzing psychological effects (as described by the study participants and parents/guardians), most of the cases, 180 (69.2%) were having irritability, 140 (53.8%) stress, 131 (50.1) anxiety while depression symptoms were seen in 32 (12.3%). In terms of social effects (as described by study participants and parents/guardians), poor communication was noted in 164 (63.1%) whereas declining performance in the school in 138 (53.1%) cases.

Characteristics		N	%
Age (years)	8-11	102	39.2
	12-18	158	60.8
Gender	Boys	125	48.1
	Girls	135	51.9
Education	Middle or below	83	31.9
	High School	98	37.7
	Elementary School	79	30.4
Neck Flexion	During Studying	260	100
	During Mobile Phone or similar devices usage	260	100

Table-I. Characteristics of study participants

Findings		N	%
Pain Location	Neck	260	100
	Shoulder	188	72.3
	Lower Back	165	63.5
	Arms	51	19.6
Eye Symptoms	Eye Strain	64	24.6
	Dry Eyes	24	9.2
Psychological Effects	Irritability	180	69.2
	Stress	140	53.8
	Anxiety	131	50.1
	Depression	32	12.3
Social Effects	Poor Communication	164	63.1
	Declining Performance in the School	138	53.1

Table-II. Pain location, eye symptoms, psychological and Social Findings amongst study Cases

DISCUSSION

Musculoskeletal neck pain is quite frequent in children and adolescents age groups. Studies analyzing children and adolescents with musculoskeletal neck pain have found a prevalence as high as 87% in this age group. Most studies report 28-40% incidences of neck pain amongst these age groups.^{2,13}

In the present study, we noted that all the cases were having flexion of their back as well as neck during studying. Similar findings have been reported by other researchers as well. Fares J, et al from Beirut Lebanon¹² noted that all the

children and adolescents (100%) in the study were having flexion of their back as well as neck during studying. Ariens GA et al² describing epidemiology of neck pain noted a positive linkage between neck flexion and neck pain. They suggested 70% enhanced risk of pain involving neck while studying with flexion of 20°.

In our study, all the participants had shown strong flexion of neck while using mobile phones or similar devices. Terminology of text neck was obtained in the recent years as the onset of cervical spinal degeneration due to repeated stress related to frequent head flexion while texting from mobile phones or similar devices for long periods of times.¹⁴ Text neck has been found to be increasing as more and more individuals commonly teenagers are bending over mobile phones during its usage.¹⁵ It has been calculated that over 70% of the global population spend hours every day hunching over mobile phones and similar devices having their heads flexed forward.¹⁶

In the present study, we noted that cases were spending a mean duration of 132.64 minutes with standard deviation of 58.2 minutes while using mobile phones or similar devices. In a recent study from Lebanon¹², it was noted that children and adolescents spent more than 5 hours daily with their heads tilted while using mobile phones and hand handled devices. Hansraj KK¹⁷ calculated that an average of 5000 hours are spent by high school students in poor postures. When head is flexed and forwarded, a significantly more weight is put on spine. Weight of a fully grown head is estimated to be 4.5-5.4 kilograms at a neutral position but 12.3 kilograms when head is tilted forward at 15 degree, 18.1 kilograms at 30 degree, 22.2 kilograms at 45 degree whereas 27.2 kilograms at 60 degree.¹⁸ Repeated forward flexion originates modifications in cervical spine, curvature, support ligaments, tendons, musculature and the body segments, may go on to cause postural changes and pain in the neck as well as adjacent areas.³

In this study, we noted that 64 (24.6%) were having eye strain and 24 (9.2%) had dry eyes. Neck's

forward flexion surpasses pain to contribute in other complications related with the neck pain. Many a times, prolonged neck flexion have been noted to be a contributor to eye complaints such as strain or dry eyes.¹² Nearsightedness, a disorder where eyes are compelled focus objects placed nearby, is also an effect of prolonged neck flexion.⁸ A study done by Fares J et al noted that 12% of the study participants with neck pain had eye strain while dry eyes were reported in 7% and near sightedness in 3%.¹² Curtis S in 2014¹⁹ stated in his research that “texting for long periods ‘could lower life expectancy’”. The said research found a connection between forward flexion and hyperkyphosis which is known to be linked with pulmonary disorders as well as cardiovascular problems. It has also been proposed that when individuals drop their heads and round their shoulder for using mobile phones or similar devices, it is difficult to take a full breath as muscles are restricted while ribs can also not move properly. These are the reasons that heart and lungs are restricted from functioning to their full ability.⁹ Research in the recent years have beginning to show that those individuals who use too much mobile phones or similar devices may go on to face problems involving pain in the later years of life, or even the will face significant cuts in their life expectancy.¹²

Emre M and colleagues²⁰ shared that computers, wifi, mobile phones and televisions emit very low frequency electromagnetic field. Electromagnetic radiations have been seen to cause sleeping disorders, headache, tingling in the hands, ringing in the ears, eye pain, low immunity, attention deficit disorders as well as autism.²¹ In comparison to an adult, absorption of these radiations through Children’s head can be more than 2 times while absorption in the skull bone marrow can be as high as 10 times.²²

In the current work, while analyzing psychological effects (as described by the study participants and parents/guardians), most of the cases, 180 (69.2%) were having irritability, 140 (53.8%) stress, 131 (50.1) anxiety while depression symptoms were seen in 32 (12.3%). In terms of social effects (as described by study participants and parents/

guardians), poor communication was noted in 164 (63.1%) whereas declining performance in the school in 138 (53.1%) cases. These findings are similar to other works where parents of most cases with musculoskeletal neck pain noted their children to be more isolated and accompanying irritability.¹²

Children using more than 1 to 2 hour of technology daily are at 60% increased risk of having psychological problems.²³ More time spent by children while using mobile phones or watching television, reflect badly in their academic performance. Spending too much time using mobile phones or watching television have been shown to reflect in low communication skills.¹²

General public awareness regarding measures to avoid risk factors like improper posture while using mobile phones, studying or watching television should be conducted to reduce the chances of musculoskeletal neck pain amongst children and adolescents.

This is the first study of its kind in our setting while we did not have any authentic tool identifying the extent or validity of the neck pain and this was a limitation of this study. As, no authentic instrument evaluating neck pain amongst children or adolescents occur, self administered instrument is quite challenging while analyzing literate and illiterate population. More research to form a unified instrument measuring musculoskeletal neck pain and authentication across different populations should be done so that the factors and mechanism involving neck pain amongst children and adolescents can be established. Studies with long term follow ups in similar age groups can also measure the extent of the burden that neck pain is having in our children and adolescents.

CONCLUSION

Musculoskeletal neck pain is frequent amongst children and adolescents. Hunching the head, neck and shoulders on mobile phones and similar devices, as well as improper posture during studying and watching television increase stress on cervical spine area, may be leading

to musculoskeletal neck pain. Children with musculoskeletal neck pain suffer with eye symptoms as well as psychological and social problems.

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AUTHORSHIP AND CONTRIBUTION DECLARATION

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2	Umair Ahmad	Study design, Literature Review, Discussion.	
3	Fazal Ur Rehman	Data analysis, Proof reading.	
4	Zubair Khalid	Study design, Data collection.	
5	Saba Ahmad	Drafting, Data handling.	