To evaluate the effect of bike riding on posture and the associated deformities

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ABSTRACT

Objective: To evaluate the effect of bike riding on posture and the associated deformities.

Study Design: It was an observational study.

Sample Size: 30

Sample population: Students of Ziauddin College of physical therapy and physiotherapist of Ziauddin hospital.

Method:Each participant was asked to stand in a quiet room with air condition at 26 degree and appropriate lightening. We informed the participant about full procedure and distribute the consent form among all participants3Each participant attended an experiment on different stations to measure different deformities. Each session consisted for 15-20 minutes. Participant voluntarily answered the pre survey questionnaire before experiment. Afterward physical examination is done i.e. height and weights of participants are taken. During session scoliosis, kyphosis, bilateral shoulder shift and lumber lordosis are measured at each station and then participants are allowed to rest there for 5 minutes.

Result:Result shows that there was no significant effect on bike riding in overall health but there is a significant effect of having pain due to prolong riding and faulty posture.

Conclusion:There was no significant effect on life style, type of bike use, duration of riding bike from years to years, estimated time of riding, localized pain, pain spread, numbness after riding, feeling pain in sitting or standing on cervical, thoracic, lumber spine, shoulder and neck.

But there was a significant effect on cervical, lumber and thoracic spine in bike rider which having pain while riding, prolong riding time and faulty sitting posture.

Key words: Bike riders, bike, scoliosis,Kyphosis, lordosis, bilateral shoulder shift

INTRODUCTION:

Commonly the people are using different vehicles for traveling in urban as well as in rural areas which includes cars, trucks, motor bikes and lorry. In years motorcycles usage increased day by day in world especially in Asian countries and this rate growing rapidly. In Asian countries the annual growth rate of sales and purchase ratio increased than European countries. In develop cities most of the middle class people using motor bike (MB) for

transportation. Mechanically human beings are made structurally for walking not for sitting purpose.[1]

Currently prolong sitting mostly effect the Spine and associated structures due to sedentary life style, Malnutrition, economic cause, prolong office work and prolong riding without support. Mostly middle class people are going to work place by MB by prolong riding and some have to perform occupational tasks for extended periods as like TCS service provider periodically promotes changes in posture . Movements after prolong sitting increases low back injury risk.[2]Generally acquired sitting posture for a long time increases fatigue level of lumbopelvic muscles, particularly lumber multifidus (LM) and internal Oblique (IO).This muscles help in providing a local system for counterbalancing the compressive forces on spine and helps in spine stability at lumber area.

Backward rotation of pelvis and reduction in lumber lordosis, thigh trunk angle, knee angle reduced in sitting posture. Also cause increase in back muscles effort and disc pressure.Sitting back angle, seat bottom angle, foam density, height above floor and pressure of armrest affected by sitting posture.[3] However in sitting pelvis rotates posteriorly and lumbar spine becoming straighten out, that causes large compressive forces on disc of lumbar spine as well as pressure on posterior structures of spine. Low back

compressive load higher in sitting as compare to standing.Higher level of activation in group of muscles of upper and lower erector spinae in sitting than standing. Passive tissue forces reduce in standing and give a good rest than sitting. identified cause of mechanical low back pain is prolong sitting. Anteriorly wedging of intervertebral disc is found in sitting posture. Load on the body can be supported by two different ways. First the spine supported by abdominal pressure during sitting. Second erecter spinae muscles group will be turn off due to relaxation and kyphotic posture adopted due to prolong sitting. Due to this kyphotic posture causes increase in posterior fibers of intervertebral disc, posterior ligaments of spine and also causes increase in intradiscal pressure which is major cause of low back pain and postural deformities as like kyphotic posture. Increase in forward flexion posture increase the compressive load on spine especially lumber by 16%. As this problem take for granted then this will cause increase force transferring to facet joints. Increase in time spent in this posture will cause low back pain. Total lumber lordosis measurements are found to be lower in back pain suffer than non back pain suffer. [4,5,6,7,8]

According to the spine deformities major deformities are scoliosis (abnormal lateral curvature of spine mostly thoracic spine)[9]Kyphosis (upper back and shoulder rounded forward

abnormally and increase convexity posteriorly mostly thoracic spine)[10] Lordosis(increased curve of lumbar spine just above the buttocks)[9] and shoulder shift most commonly seen.[11]

If thoracic curve is disturbed the mechanical changes are produced like impaired the cervical spine functions tilted head forward as well as cardiopulmonary dysfunctions are seen. In lumbar region deformity symptoms of neurological deficit and impairment in functional activity are seen. Foresee in thoracic region create kyphoscoliosis that create death and foresee in lumbar region cause instability that produce arthritis and pain in later years. The congenital scoliosis will produce grotesque deformities and neurological deficit. In the growing spine these deformities are not produce and most of other severe complications can be prevented.[12]

Pelvic changes and spinal deformity seen mostly in the people who spend much more of their time in sitting.The posture changes depending on the alignment of spine and degenerative changes. Kinematic behavior and sagital mobility are the parameter on which upper and lower lumbar lordosis was defined. Standing and supine are significant positions in which lumbar lordosis were effect lordosis are greater in standing position and decrease in supine or sitting position. Age is a factor that significantly affect the lordosis in 20s the upper lumbar spine is more flexible as

compared to in 60s.[13]Harrison DD, Harrison SO, Croft AC, Harrison DE, Troyanovich SJ conducted a research to develop a new sitting spinal model and an optimal driver's seat And found that Sitting causes the pelvis to rotate backward and causes reduction in lumbar lordosis, trunk-thigh angle, and knee angle and an increase in muscle effort and disc pressure. Seated posture is affected by seat-back angle, seat-bottom angle and foam density, height above floor, and presence of armrests.[3]

Research showed that interrelation between the characteristics of the surface deformation, the parameters of body build, sitting posture and feeling of comfort shows that the comfort of each morphological fitting does not correspond to one special and single parameter from those physical factors.[14]

A study was done by determining relationship between interface pressure and driving discomfort but a clear, simple and consistent relationship between interface pressure and driving discomfort was not identified.[15]

The study was done by Angus F Burnett, Mary W. Corneliusa, WimDankaerts, Peter B. O'Sullivanresult showed that altered control and mechanics of the lower body part spine area unit related to the event of LBP in cyclists.[16]

Research suggest that increased thoracic kyphosis suggestivelychanges the kinematics of the scapula in humeral elevation.[17]

METHODOLOGY

It was an observational study the sample size was 30 which was collected from the participants of physiotherapy department students and OPD physiotherapist of Ziauddin hospital and university and the sampling method was Probability sampling (systematic sampling). All participants was fulfilled inclusion criteria were selected. The Performa was use to collect the data and formed consent was taken from each participant. The Data was analyzed through SPSS.16, in a cross tabulation and value of p was obtained by one way Anova Test.

RESULTS

Our primary objective was to find the effect of bike riding on cervical, thoracic lumber spine, shoulder and neck and its related deformities in Ziauddin university students and physiotherapist in Ziauddin Hospital.

Effect of life style on cervical, thoracic, lumber spine, shoulder and neck:

Value of p shows insignificant effect of life style on cervical, thoracic, lumber spine, shoulder and neck.

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
cervical curve in cm	Between Groups	1.936	3	.645	.853	.478
	Within Groups	19.671	26	.757		
	Total	21.607	29			
thoracic curve in cm	Between Groups	2.775	3	.925	.788	.511
	Within Groups	30.512	26	1.174		
	Total	33.287	29			
thoracic deviation in degree	Between Groups	14.948	3	4.983	.448	.721
	Within Groups	289.219	26	11.124		
	Total	304.167	29			
lumbosacral angle in cm	Between Groups	.849	3	.283	.440	.727
	Within Groups	16.738	26	.644		
	Total	17.587	29			
bilateral shoulder shift in degree	Between Groups	22.515	3	7.505	1.265	.307
	Within Groups	154.300	26	5.935		
	Total	176.815	29			

Effect of pain in riding on cervical, thoracic, lumber spine, shoulder and neck:

Value of p shows insignificant effect of pain while riding on thoracic, lumber spine, shoulder and neck. However there is asignificant effect on cervical spine on pain while riding which shows pain while riding more will be effect on cervical spine.

One way Anova

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
cervical curve in cm	Between Groups	3.313	1	3.313	5.072	.032
	Within Groups	18.294	28	.653		
	Total	21.607	29			
thoracic curve in cm	Between Groups	.037	1	.037	.032	.860
	Within Groups	33.250	28	1.187		
	Total	33.287	29			
thoracic deviation in degree	Between Groups	5.104	1	5.104	.478	.495
	Within Groups	299.062	28	10.681		
	Total	304.167	29			
lumbosacral angle in cm	Between Groups	.504	1	.504	.826	.371
	Within Groups	17.082	28	.610		
	Total	17.587	29			
bilateral shoulder shift in degree	Between Groups	4.760	1	4.760	.775	.386
	Within Groups	172.055	28	6.145		
	Total	176.815	29			

Effect of localized pain while riding on cervical, thoracic, lumber spine, shoulder and neck:

Value of p shows insignificant Effect of localized pain while riding on cervical, thoracic, lumber spine, shoulder and neck.

One way Anova

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
cervical curve in cm	Between Groups	1.318	1	1.318	1.818	.188
	Within Groups	20.289	28	.725		
	Total	21.607	29			
thoracic curve in cm	Between Groups	.544	1	.544	.466	.501
	Within Groups	32.742	28	1.169		
	Total	33.287	29			
thoracic deviation in degree	Between Groups	.868	1	.868	.080	.779
	Within Groups	303.299	28	10.832		
	Total	304.167	29			
lumbosacral angle in cm	Between Groups	.272	1	.272	.440	.512
	Within Groups	17.314	28	.618		
	Total	17.587	29			
bilateral shoulder shift in degree	Between Groups	7.729	1	7.729	1.280	.268
	Within Groups	169.085	28	6.039		
	Total	176.815	29			

DISSCUSION

Past studies show that there is change in posture during prolong bike riding in different people of different age but we specify the age group 18-35 and population students and physiotherapist from Ziauddin hospital in our study we find the deformities due to posture changes.

Prolong bike riding show a marked effects on cervical spine .we assess the cervical spine through scoliometer and postural grid when we evaluate the cervical curve during measurements there is a significant deviation of values from normal values we find that mostly cervical lordotic curve is increase in most of the participants these results are obtained from scoliometer on the other hand cervical curve is also asses by postural grind and we find that there is a forward tilt of head is noticed. These all changes are due to prolong bike riding and faulty sitting posture.

The result shows that there is great effect of bike riding on thoracic spine we compare the our study from past studies [18, 19, 20,21to] find the difference in result when we evaluate the thoracic spine we took measurements through scoliometer we find that there is thoracic deviation in most of the people from the normal value but when we assess the thoracic spine through postural grid there is no significant increase in thoracic deviation

As compared to past studies[18,19,20,21]there is no mark able increase in thoracic curve our study show that there is no significant association between bike riding and thoracic curve changes as previous studies states that these changes in cervical curve is due to faulty posture when we assess the thoracic curve through postural grid there is increase in thoracic (kyphotic) curve

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CONCLUSION

The study concluded that there is no significant effect on life style but there is a significant effect on cervical, lumber and thoracic spine in bike rider which having pain while riding, prolong riding time and faulty sitting posture.

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