REVIEW ARTICLE

Correlation of back pain with obesity and posture among teenagers

Ali Raza,[1,2]*, Muhammad Jamshaid, PhD (Pharmacy)[3], Tehseen Riaz,[4,2], Irfan Bashir[1,2,5], Imtiaz Majeed, PhD (Pharmacy)[1,5], Waqas Akram, MS (Pharmacy)[6]

[1]PhD scholar; [3]Dean; [4]MPhil scholar; [5]Assistant Professor, [6]Lecturer
Faculty of Pharmacy, University of Central Punjab
[2]Foundation for Young Researchers

***Correspondence:** Ali Raza, 468 H-2 Johar Town Lahore, Punjab (Pakistan); Phone: +92 301-7512114; E-mail: Ch. aliraza14@gmail. com

ABSTRACT

Low back pain (LBP) rises rapidly during adolescence, reaching adult levels at the ageof 18. It has been suggested that adolescent LBP has least effect. Back pain usually effects females more than males and athletes are more effected by it. Sciatica and Scoliosis are the main causes of back pain. Sciatica might due to sensory deficit while, scoliosis is the abnormal curvature of spine. Disc herniation, degenerative changes, compression are the causes for sciatica while vertebral anomalies, neuromuscularfactors caused scoliosis. As sciatica is not a disease, so diagnosed with nonspecific low back pain which can be treated with acupuncture treatment or spinal infiltration. Lumbar corpectomy, disc replacement and screw usage are the ways of treatment for scoliosis.

Key words: Back pain; Adolescence idiopathic scoliosis; AIS; Extradural myxopapillary ependymoma; Arthrodesis; Spondylolisthesis; Congenital diaphragmatic hernia

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BACK PAIN

Back pain is common and disabling condition, usually long term with an estimated lifetime prevalence of 70%-85%. Low back pain (LBP) is in the list of second most common pain for which patient seeks for physician treatment and is also a main reason for disability & absence and the costs for the treatment of LBP whether directly or indirectly stumble to the society.[1] Excessive use of computers among adolescents can be one of the leading cause of back pain and musculoskeletal disorders among adolescents.[2]

Girl teenagers had significantly less head flexion, neck flexion, and thoracic flexion, butmore anterior pelvic tilt than males. They also shown more craniocervical angle as compared to males while looking down when sitting.[3] LBP is common in girls who are growing and during their more or less activity. It is more common in athlete requiring rotation of spine .wrestlers, divers, volleyball, and cricket). In the young athletes back pain is usually related to the posterior elements of spine and disc problems are rare.[4]

Muscle imbalance, improper flexibility and structural differences of the spine in adults make sensitive to back injuries. Back pain usually results from wrong technique and excessive training mainly during rapidly growing periods.[5] Poor muscle flexibility and trunk strengthen is shown as the risk factors for LBP. Poor hamstrings flexibility associated to LBP in adolescents and adults. So LBP results due to poor hamstrings flexibility rather than a cause.[6] Back pain disturbs the postural control and can also alter trunk muscle activity in acute and chronic pain patients. So, there is a need of periodic assessment and monitoring as to identify and appropriately rehabilitate the impaired posture and alteration in trunk muscle activity.[7]

From adolescence to adulthood 80 to 85% of people suffer from this disorder in this modern era.

However, it results in huge loss of time and working activity costing much money. Acute LBP lasts less than 6 weeks, while in case of chronic LBP pain lasts longer than 12 weeks. Physical, psychological and organizational factors, as well as some personal factors can also affect the musculoskeletal condition of workers. Computer related work presents environmental and productivity risks due to poor and clunky postures that are maintained for a long time, recurrent and sometimes forceful.[8]

About 70-80% of the adults experience LBP at some point in their life throughout the world. Of these, 80-85% are related to non-specific back pain. Worldwide, even during childhood LBP is a major health issue with an annual prevalence of 19-58% in school going children. The prevalence rate approaches to that in adults over school age and it is lower in boys as compared to girls.[9] LBP continuously exists as a condition with a considerably high prevalence and incidence. Chronic LBP is one of the absolute defect cause in the industrialized world with reported lifetime prevalence of up to 85%. Back pain is usually recurrent and also affects the occupation and quality of life. In rare cases, acute back pain might indicate some serious ailment, e.g. infection, tumor or other diseases. It has a serious impact on lifestyle and quality of life. Degenerative spondylolisthesis is one of the major causes for LBP, and its etiology may have many factors linked with other pathologies.[10]

TYPES OF BACK PAIN

1. **Sciatica:** Sciatica is a group of symptoms, that are generally produced by compression or irritation of one or more spinal nerve roots supplying each sciatic nerve; it may involve left or right, or both sciatic nerves by irritation or compression.[11] It is mainly a syndrome with or without sensory deficit, and is usually caused by lumbar disc herniation. With conservative treatment, most of the patients recover within six weeks from sciatica.[12] Any disease or injury my cause the disability of LBP. Pain symptoms are usually not related to the radiological evidence of spinal pathology but the secondary changes in the neural function are initiated by pathology in susceptible individuals.[13]
2. **Scoliosis:** Scoliosis is the lateral curvature of spine that can be congenital, neuromuscular-related or idiopathic in nature.[14] Scoliosis is also newly developed in skeletally mature patient is called degenerative lumbar scoliosis (DLS) or de novo scoliosis.[15] In the pedicle screw based spinal instrumentation, apical vertebral derotation and segmental vertebral derotation are used for the transverse plane correction.[16] Congenital diaphragmatic hernia (CDH) is a severe congenital deviation which occurs in 1 in every 3000 live births .[17] In orthopedics, early onset scoliosis (EOS) is the most cumbersome disorder and it might ultimately be fatal in patients with poor pulmonary development.[18]

CAUSES OF LBP

Sciatica is most commonly caused by disc herniation.[19] Disc herniation is caused by biomechanical factors, degenerative changes and the condition that enhance the disc development that might not prove to be symptomatic.[20] It is usually caused by compression or inflammation of nerve roots within the intervertebral foramina due to herniated nucleus pulposus in the lumbar region of the spine.[21] Sciatica rarely arises from piriformis syndrome (0.33-6%). Trauma, a patent sciatic vessel causing pressure, and myositis ossificans are some of the causes of piriformis syndrome.[22] Congenital scoliosis is mostly caused by a hemivertebra and it creates wedge shaped deformity which is gradually increased during spinal growth.[23] Early onset scoliosis is caused by congenital vertebral anomalies, neuromuscular conditions, associated syndromes and structural lesions of the central nervous system (CNS).[24] Its not particular but genetic factor might involve in adolescence idiopathic scoliosis (AIS), because of its high prevalence in male children (27%) than girls.[25] Progression of deformity in EOS relates to multiple complications like pulmonary compromise, premature spinal fusion and infection.[26] The vertebral derotation strategy during maintenance surgery, causes the shifting of taller convex wall and taller anterior wall in the ventral direction.[27] In case of bone morphogenetic (BMP) usage, pseudoarthrosis occurs after revision surgery and can regain in the 5 years of index surgery.[28]

DIAGNOSIS

As there is no clinical definition for sciatica, it is commonly not considered as a disease, but a symptom. By specific clinical features, it can be distinguished from non-specific LBP.[29] From all sickness-days, more than 10% of the people are diagnosed with LBP. From these patients, people with sciatica have long absence from work, and less of them return to work as compared to non-specific LBP.[30] AIS patients are usually diagnosed with worsening back pain, progressive skeletal deformity

or neurology related symptoms like radicular pain, radiculopathy, neurogenic claudication.[31] An old man was diagnosed with lumbar extradural myxopapillary ependymoma and after fourteen years he presented with worse LBP.[32] Idiopathic scoliosis is known as the common reason for spinal deformation which has no accredited etiology.[33] AIS can cause asymmetry of trunk and can lead to more complications like cardiorespiratory and orthopedic problems, if left untreated.[34]

TREATMENT

Nerve root irritation as a result of disc herniation has many modes of treatments; oral analgesics followed by spinal infiltration of corticosteroids and then surgery.[35] Many studies revealed that acupuncture has the ability to relieve the symptoms of sciatica with the increase of pain threshold in human.[36] 10% of people have shown lumbar disc prolapse with persistent and progressive radicular symptoms, in which micro-discectomy and decompression in the form of surgical management has been proven to be beneficial after 6 weeks .[37] The effectiveness of lumbar spinal fusion for discogenic pain, fusion surgery and disc replacement is also increasing.[38] In case of deformation severity to non-operative management, arthrodesis might be postponed by performing surgery, which prevents thoracic and vertebral growth if performed early.[39] AIS can be surgically managed by posterior spinal fusion with pedicle screws.[40] Dual attending surgeon strategy is used for complex spine surgery and has been found beneficial to reduce blood loss and complication rate.[41] The use of magnetically distracted growing rods was first described by Cheung et al. for the treatment of early onset scoliosis.[42] For the improvement of AIS, recently developed technique is in which two rods are connected to the screw heads and simply rotated simultaneously to correct the scoliosis.[43]

CONCLUSION

Back pain is very common and among the major disability problems of society. It cannot be easily diagnosed clinically and it results in huge financial burden every year in terms of lost work days as well as the expenses on treatment. There are different factors including physical, mechanical or nerve related. It acutely affects teenagers due to the excessive use of computers and athletes due to wrong posture. Obesity cannot be neglected in LBP but it is a weak risk indicator due to lack of sufficient evidence. Back pain affects more females than males. There are some causative factors which cannot be overcome, but we can manage these problems or symptoms by changing our daily lifestyle.

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