Evaluation Of Spina Bifida Occulta In Young Patients Presented With Low Back Pain

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ABESTRACT

Introduction :Spina bifida occulta is a condition arising during neurological development as a result from neural tube failing to close, it was a widespread with I the lumbo-sacral spine. The lesion is present at birth and the incidence of SBO decrease with age, it can be associated with many congenital disorders like intraspinallipoma, tethered cord syndrome and genitourinary dysfunction. Prevalence of SBO is related to various factors such as genetic predisposition , environmental factors and drugs.

Methodology : This was a descriptive study of young patients with low back pain diagnosed as spina bifida occulta, the duration of the study 2 years, 80 patients were selected ho complaining from low back pain with or without neurological signs for at least 4 weeks. All patients evaluated with standard lumbo-sacral X- rays ad patients with neurological signs evaluated with lumber vertebra magnetic resonance images (MRI) and all these images evaluated by Radiologist according to the 2001 standard of the North American Spine Society. The bone defect divided into 3 groups, group 1 with incomplete SBO in one level, group 2 incomplete SBO in two adjacent vertebra and group 3 , complete SBO involving all posterior arch.

Results :Of the 180 study patients . 35 % female and 65 % male. The age range was 15-35 years , 91.1 % without neurological signs while 8,8% with neurological signs. SBO most commonly observed at L 5 (45.4 %). Patients with or without neurological deficit or signs showed no correlation for the presence of single or multiple level of SBO, but significant difference was observed between these groups for disc prolapse in CT and MRI.

Conclusion : Presence of SBO should always think in young patients with a pain with or without neurological signs. A thorough evaluation is required to identify the causes of LBP which includes a detailed history, physical and neurological examination and radiological imaging to confirm the diagnosis.

Keywords: Spina bifida Occulta ; Low back pain ; Radiculopathy ; Neurological deficit

INTODUCTION

Spina bifida occulta (SBO) is a common anomalies of the spine presented at birth [1].The condition arising during neurological development as a result from the neural tube failing to close, which normally closed by the fourth week of gestation .This developmental abnormality typically presented with in complete fusion of the lamina without affecting the spinal cord [2,3]. It is usually observed at the fifth lumber vertebra and /or upper one or two sacral vertebra [4,5,6].

The prevalence of the spina bifida is related to various factors, genetic predispositions , environmental factors , teratogenic effects of the drugs are important [7,8], it may be caused by the prenatal use of drugs like Valproic acid [9]. Same cases are preventable by regular administration of folic acid during pregnancy [10].

Spina bifida can be associated with many congenital disorders like intra spinal lipoma , tethered cord syndrome , genitourinary dysfunction with increased incidence of lumber spondylosis , discopathy or sringomyelia.[11]

The prevalence range of spina bifida occulta between 0.6-25 % , fusion posterior elements can developed at later age during growth f the bones, the risk of neural tube defects is approximately 3 – 7 %, It is more common in first born children with evidence for involvement of second degree relative in the spina bifida occulta. A family in whom spina bifida cystica had already occurred , their second child can have multiple congenital vertebral defect.[12]

Physical examination finding often including patch of hair on the dermis above L4-L5 segments.[13] Decrease of the motion in the spine and pain with extension are other finding. Post natal diagnosis of spina bifida occulta is initially with the use of radiographs of the lumber spine and can be confirmed using computerized tomography or magnetic resonance imaging.[14]

METHODOLOY

This was an observation descriptive study of patients with back pain diagnosed as spina bifida occulta .The study included 180 patients with low back pain (LBP) between October 2015 and October 2017 ,the mean age of the patients was 25 years range (15-35 years).Patients had LBP for at least 4 weeks .

Al patients assessed by may criteria including history , complete blood count , CRP, ESR, Latex test , and neurological examination.Patients with history of trauma ,previous surgery , spondylolesthesis , scoliosis an any systemic diseases that cold affected normal value excluded from this study.All patients evaluated with standard lumbo-sacral X-ray ,antero posterior and lateral view and that patient with neurological signs valuated with lumber vertebral magnetic resonance images (MRI) , all images were evaluated by radiologist according to the 2001standerd of North American Spine society of lumber disc pathology.[15]

Patients weredivided in to two groups, group A with neurological deficit and group without neurological deficit. The deficit included positive straight leg rising , sensory and motor signs , deep tendon reflexes, and patients with second group had o

neurological signs.Back pain may be classified by methods to aid its diagnosis and management , the duration of back pain is considered in three categories following the expected pattern of healing of connective tissue.Acute pain last up to 12 weeks ,sub-acute pain refer to second half of the acute period (6-12) weeks, ad chronic pain is pain which persist beyond 12 weeks.

Bone with incomplete closure between one or more adjacent lumber and sacral vertebrae were grouped to complete or incomplete spina bifida occulta those having open dorsal wall representing complete failure of fusion of lamina, the bone were observed and finding were divided in to three groups:

Group 1: incomplete spina bifida occulta in one vertebra.

Group 2: incomplete spina bifida occulta in two adjacent vertebra.

Group 3: complete spina bifida occulta involving all posterior arch.

RESULTS

Of the 180 study participants , 63 were girls (35%) and 117 were boys (65 %). The age rand was 15 – 35 years . sixteen (8.8%) patients had a neurological signs.Out of 16 patients with neurological signs , 12 male (75 %) and4 (25 %) were female, while those patients without neurological sign ,96 were female (58.5 %) and 68 (41.4%)were male.Table 1.

Spina bifida occulta was most commonly observed at L5 in 85 patients (54.4 %). Table 2 .And of two site at level of L4 - L5. Table 3

Patients with or without neurological signs showed no correlation for the presence of single or multilevel of SBO but significant difference was observed between these groups for disc prolapse in CT and MRI.

Bone defect were grouped in 3 groups , first group with incomplete SBO ,second group incomplete SBO in to adjacent vertebra while the third group there is complete defect in posterior arch . SBOin one level showed higher prevalence and was found with over all prevalence (86.6 %) . Region at level of L 5 (54.4 %) , in second group the prevalence of SBO involved in two adjacent vertebra were 8.8%, while the complete defect of 3rd group seen only in (4.4%). Table 4

Table 1: distribution of congenital anomalies according to the presence of neurological signs.

Total	**with neurological signs**	**without neurological signs**	
180	16 (8.8 %)	164 (91.1 %)	
Female	**Male**	**Female**	**male**
4 (25 %)	12 (75%)	96 (58.5 %)	68 (41.4 %)

Table 2 : Prevalence of spina bifida according to vertebral level and age

	Total156	**15-20 years**	**20-25 years**	**25-30 years**	**30-35 years**
L4	42 (26.9 %)	6 (14.2 %)	18 (42.8 %)	10 (23.8 %)	8 (19%)
L5	85 (54.4 %)	22 (25.8 %)	36 (42.3 %)	16 (18.8 %)	11 (12.9

					%)
S1	29 (18.5 %	8 (27.5 %)	14 (48.2 %)	5 (17.2 %)	2(6.8 %)
Total		36 (23 %)	68 (43.5 %)	31(19.8 %)	21 (13.4 %)

Table 3 : distribution of the type of congenital defect

	Total	**Female**	**male**	**With Neurological deficit out of 16**	**Without Neurological deficit out of 164**
Incomplete SBO for one vertebra	156 (86.6%)	85 (54.4%)	71 (45.5%)	2 (1.28%)	154 (98.7%)
Incomplete SBO between two adjacent vertebra	16 (8.8%)	9 (56.2%)	7 (43.7%)	8 (50 %)	8 (50 %)
Complete SBO involving all posterior arch	8 (4.4%)	6 (75%)	2 (25%)	6 (75 %)	2 (25 %)

Table 4 : prevalence of SBO according to vertebral level with sex .

vertebral level	**Total 16**	**15-20 years**	**20-25 Years**	**25-30 years**	**30-35 years**	**Female**	**Male**
L4 and L5	9	3 (33.3%)	4 (44.4%)	1 (11%)	1 (11%)	6 (37%)	3 (18.7%)
L5 AND S1	7	1 (14.2%)	5 (71.4%)	1 (14.2%)	0 (0%)	5 (31.2%)	2 (12.5%)

DISCUSSION

More than 90% of nonspecific low back pain (LBP) patients resolved spontaneously within two weeks , prolonged LBP and higher tendency for recurrence when associated with congenital bone defect or disc herniation .

Spina bifida oculta is a congenital anomaly of multifractional origindeveloped due to hypoplasia ofone or both component of neural arch,the anomalies common in male as in female and young adult showhigher rate of occurrence.[16]

Location of SBO varies among different population , it was 1% in Japanesepopulation.[18] And 1.5 % [19] and 2 % [20] in Indian population , while the value are very high among other population, it is being 17 % among Israeli population , 28 % in Chinese population and only 3.33 % in Egyptians.[21]

The presence of SBO has been accused as the cause of low back pain due to reduce the attachment it's for multifidi muscle and presence of the spinous process of fifth lumber vertebra on nerve root during extension which leadingto proprioception impairment that could contributed to lower lumber instability.[22,23]With an increase instability , this can lead to higher incidence of LBP.[24]

Children with spina bifida occulta have suggested that new bone formation and increase stability of the spine may occur with increasing age and the defect on posterior arch may be decrease in size or filled up.[25,26] In our study SBO was detected in 68 (43.5 %) of 156 adults aged 20-25 years , while this number decreased to 21 (13.4%) at age of 30-35 years. The long term follow up is required to demonstrate the union , fusion , or degenerative disorder changes accompanying this anomaly .

Degenerative changes can lead to potential low back biomechanical faults as these in children progress in to adulthood.The accompanying changes include disc prolapse ,sponylosis , disopathy and even visceral complaints such as constipation.[27]

Neurological and radicular sign is very important in location of spina bifida occulta and has a number of clinical implication in this study, the patient presented with neurological sign was 16 (8.8 %) and 164 0f 180 patients (91.1 %) without neurological signs, spoylolesthesis not observed in any of the patients with SBO, and reported that a higher incidence of posterior disc herniation and radiculopathy was showed in patients with SBO of S 1 vertebra, which increased with age. This can be explained by instability of the base of the lumber spine caused by spina bifida occulta at S1,which produces a predisposition to posterior disc herniation. The result were statistically significant.

Milic et al, also conducted a study on children , they reported that SBO were related to disc degeneration in children ,however they statistically evaluated SBO as an anomaly. [28]They explain that the causes of anomaly , disc degeneration , spondylosis may lead to lower back pain. So the lumber range f motion with SBO may have the same movement patterns as an intact lumber spine , although this does not take in to consideration activities of daily living of individual.[29]

The most common site of spina bifida occulta for chines and Israeli people was S1 - S2. [21] While long bone defect S3 - S5 was most common among Egyptian people.Prevalence of spina bifida occulta in our study related to L 5 (54.4 %) while the complete SBO was very high in this study 4.4 % as compared to < 2 % of British[4] ,zero % in Australian[30] and 3.33 % in Egyptian population.

CONCLUSION

Presence of spina bifida occulta should always think in young patient with backache with or without neurological sign . A thorough evaluation is required to identify the causes of LBP which included a detailed history , physical and neurological examination and radiological imaging to confirm the diagnosis.

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