

# Incidence of Spina Bifida Occulta

Nashee Nafi Al-Hafidh

Head of X. Ray department in Ibn Sina Teaching Hospital 2018

## ABSTRACT

Spina bifida occulta is congenital anomaly appear as a failure of fusion of the posterior arch of lumbosacral spine above S3 was sought on frontal radiograph of 1828 patients. This study to know the incidence of spina bifida occulta in Iraqi population .The patients were aged from 7days to 90 years over 3years period and the study also aimed to notes the relation to patient complaint on daily work in Mosul Teaching Hospital then to compare the result to other studies .The overall age-adjusted incidence was 17.9% with high significant to patient complaint of backache and urinary symptoms .The incidence differ with different age groups then discuss the causes of such difference. Conclusion shows same result as previous studies in other areas.

**Key words:** Spina Bifida occulta, backache, urinary symptoms

## INTRODUCTION

Spina bifida occulta (S.B.O) is a common finding during routine daily work in Radiology Department. There has been interest in the importance of this finding of unfused posterior arch or the lumbosacral Spines radiograph since the early days of radiology. The reported incidence of S.B.O. varies in different published studies (Table 1). Various clinical presentations have been also attributed to S.B.O. such as backache and enuresis.

This study aims to find the incidence of S.B.O. in our population and to try to define if any correlation with backache is found. Antenatal ultrasound generally has a high detection rate for spina bifida. Ancillary intracranial sonographic findings: Lemon sign and Banana sign<sup>[14]</sup>

Computerized Tomography is an excellent imaging modality for characterization of vertebral bony anomalies, while Magnetic Resonance Image is excellent in characterizing the soft tissue spinal anomalies of spinal dysraphism<sup>[8]</sup>. Computerized Tomography used for very small slit-like S.B.O., while Magnetic Resonance Image used for cord tethering , intraspinal lipoma and lipomeningocele.<sup>[9]</sup>

**Table (1) Incidence of S.B.O**

Year	Authors	%
1926	Roeder and Largot	33
1928	Kohler	10
1929	Willis	1.2
1938	Dittrich	5-36
1944	Brech,Hillsman and Basom	6
1946	Friedman ,Fisher and Vandermark	36
1949	Gillespie	4.8
1950	South worth and Bersack	18.6
1953	Brails Ford	16
1959	Crow and Bragdon	36
1962	Epstein	5-36
1967	Lorber and Lerick	5
1971	Murray and Jacobson	20
1972	James and Lassman	5
1974	Eckstein	50
1985	Boone D.	17.3

### MATERIAL AND METHODS

The plain X-Rays of the lumbar spines and plain X-Rays of abdomen of (1828) patients were included in this study. They were (932) male and (896) female. ranging in age from 7 days to 90 years. Patients were referred to the Radiology Department of Mosul Teaching Hospital from the Out Patient Department coming for different complaints including urinary, backache and other acute abdominal conditions.

Those radiographs judged positive for S.B.O. when they showed definite failure of fusion of the posterior arch of one or more vertebrae above the level of the third sacral segment. All the films are examined carefully for S. B. O. X-Rays of patients who are not prepared are dismissed from this study. A full record of the patients complaints, the result. of the examination of spines for S.B.O. and the age are included in form and grouped for decade. In this study the age of patients taken. started from 7 days to 90 years but most of X-Rays which were excluded belong to infants, because these X-Rays are unclear due to bad preparation and motion unsharpness. Statistical testing is by the X2 test.

### RESULTS

Of the 1828 patients whose radiographs were surveyed 329 were shown to have S.B.O an incidence of 17.99%.The younger age group (<40 years) shows a very much higher incidence of S.B.O. than those above 40 years, 19.6% compared with 8.3%. This difference is significant (P<0.001). (Table 2) shows the distribution of S.B.O. in different ages.

Concerning the relation with complaint of patients (Table 3) shows that very high significant relation between S.B.O. and backache, 475 patients complaint of backache, 71 of them showed positive S.B.O the difference is very highly significant (P<0.001). Also 855 patients complaint of urinary symptoms ,130 of them showed positive S.B.O. the difference is very highly significant (P<0.001).

**Table ( 2 ) Spina bifida occulta incidence by decades**

Age Interval (years)	S.B.O	Total	%	%
1 – 10	45	213	21.1 %	19.6
11 – 20	134	493	27.1 %	
21 – 30	102	616	16.5 %	
31 – 40	28	259	10.8 %	
41 – 50	12	161	7.4 %	8.3
51 – 60	4	61	6.5 %	
61 – 70	4	20	20 %	
71 – 80	0	4	Zero %	
81 – 90	0	1	Zero %	
	329	1828	17.9 %	

**Table ( 3 ) The Relation of S.B.O. with Patients Complaints**

Complaint	Total Number	S.B.O	%	Result
Backache	475	71	14.9 %	V.H.S.
Urinary	855	130	15.1 %	V.H.S

V.H.S. : Very Highly Significant

## DISCUSSION

Spina Bifida Occulta is a common finding<sup>[4,13,18]</sup>. usually present in the fifth lumbar vertebra<sup>[13]</sup>, and different reports support this finding (Table 1).

Boone D. et al (1985) study 635 patients attending an accident and emergency department aged from 2 months - 98 years as outpatient over 2 years period showed incidence of 17.3%.<sup>[4]</sup>.

While Robert B .Duthie considered incidence of 2.5 per 1000 live births in England [11]. 4.5 per 1000 in Wales and word-wide incidence of 1 per 1000 live births. and much lower incidence in Japan, North America, Australia [11].

Apley (1987) considered incidence of S.B.O. in England is proximally 3 per 1000 live births, he found that the cause is unknown and the incidence is higher in certain races. in first born children, in poor families and if one parent. or a previous child has a neural tube defect, there is a 5% risk to the next child [2].Also Boone D. et al suggested environmental, genetic and ageing factors may all affect the prevalence of S.B.O. [4].

Youmans (1982) considered that incidence of S.B.O. with or without meningocele is 0.55 per 1000. and about 25% of all children will showed some minor defect on X. Ray Since ossification continue through childhood and adolescence.

Youmans al so found that there is unquestionably a tendency for increase familial incidence of this malformation [17].

The real cause of S.B.O. is unknown [2]. The discrepancy in figures in (Table 1) is probably due to several factors. Such as different ages of population studied and whether symptoms (possibly related to the defect) prompted the radiological examination [4].

In the present study there is very high significant difference according to age groups (Table 2). In most of cases only a minor mid saggital defect in neural arch is seen. This radiolucent area represents merely non ossified cartilage. In children many of these areas become ossified as growth progresses<sup>[13]</sup>. Fusion commences after birth and completed in adolescence. So SBO in infant may represent a normal stage of ossification<sup>[15]</sup>.

The study of Boone D. et al<sup>[4]</sup> showed in age (<40 years) an incidence of S. B. O. is 29.2% and in those (>40 years) is 9.8%. This study shows in age (<40 years) the incidence is 19.6% while in age (>40 years) the incidence is 8.3%. The higher incidence in Boone D. et al study 29.2% is probably due to a large number of patients taken with lower age group.

The decrease incidence of S.B.O. after age of 40years indicate that new bone formation or calcification, well known as part of degenerative or ageing processes, may occur in the connective tissue filling the posterior arch defect<sup>[4]</sup>.

So the incidence of spina bifida occulta is particularly difficult to asses since this depends upon the age of patients in the sample analyzed and how minimal a vertebral defect is included.<sup>[5]</sup>

The present study shows a significant relation between backache and Spina bifida occulta (Table3). Backache has been proposed as important association of Spina bifida occulta<sup>[4]</sup>. The majority of spina bifida discovered in childhood and persist into adult life in normal individuals who showed no evidences of either neurological or musculo-skeletal dysfunction<sup>[17]</sup>.

Although S.B.O. may be associated with congenital anomalies of the spinal cord and cauda equina giving rise to neurological deficit which can progress to paraplegia and incontinence<sup>[1,5,7,18]</sup>. But there is no close correlation between the severity of bone defect and the degree or neurological impairment<sup>[1,16]</sup>. The cause or paralytic deformity of lower limb or bladder is traction of the cord by a fibrous band between dura and skin and this may occur at age of 10 years<sup>[11]</sup>. So the large number of patients present in this age group support this Fact (Table 2). Another lesions which may be associated with S.B.O. are duplication of spinal cord. Diastematomyelia, intra spinal lipoma, hydromyelia of central canal. these lesions seen on radiculogram and Computerized Tomography<sup>[5,11,13,15]</sup>. Musculo-skeletal disorders discovered are deformities of hips. feet. toes and scoliosis<sup>[3,5,10,13,5]</sup>. Also neuropathic disease of femora. neuropathic fracture. separation of proximal tibia<sup>[10]</sup>. Also neuropathic joints and spontaneous fractures accompanied by excessive callus in lower limbs.<sup>[1,10,13,18]</sup>

The present study showed a significant relation between spina bifida and urinary complaint (Table 3). Other studies showed that sphincter disturbance especially regression of bladder and bowel control and urinary dribbling in response to abdominal pressure and palpable relaxation of anal sphincter and enuresis<sup>[5,10,11,15,18]</sup>. Also the mean renal length in a patient with spina bifida falls below the mean of the standard renal growth curve determined by Hodson et. al.<sup>[6]</sup>.

### CONCLUSION

This study points to the common finding of SBO with incidence of 17.9% affecting about 1/5 of general population in Iraq. This study shows significant relation to backache. Further study to define relation to enuresis should be encouraged in the future.

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