

Lumbosacral Vertebral Defects Associated with Congenital Anomalies of Urinary Tract

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ABSTRACT

Introduction: It is reported in the literature that various anomalies of the lumbosacral spine are amongst the most common anomalies associated with that of urinary tract.

Material and Methods: The present study was carried out in the department of Anatomy JNMC Sawangi (Meghe), Wardha, India. The study included 50 subjects divided in two equal groups as control and study group. The subjects had undergone X-ray KUB and Intravenous pyelography. Statistical analysis was done by using Chi Square Test and Test of Significance for single proportion i.e. Z- value.

Results: The study revealed Pelvi-Ureteric Junction (PUJ) obstruction being the commonest congenital anomaly of urinary tract. Amongst the deformities of the lumbosacral spine sacralization and bifid spine were the commonest. However no laterality correlation was observed.

Conclusion: The study highlights the association between genitourinary and lumbosacral vertebral anomalies and emphasize upon the need of thorough search of these associated anomalies in the cases presenting with genitourinary anomalies.

Key Words: Vertebral defects, Congenital Anomalies, Embryological Development, Renal Anomalies

INTRODUCTION

There is an association between congenital anomalies of genitourinary tract with vertebral defects [1]. During the embryonic development, the mesoderm forming the vertebrae is also responsible for the formation of the mesonephros, the predecessor of the mature genitourinary system. The medial region of this mesoderm forms the vertebrae while the ventrolateral region forms the mesonephros [2]. Various systemic congenital defects have been associated with anomalies of specific segments of vertebral column due to temporal association of embryonic development [3]. We report the different lumbosacral anomalies observed in patients with congenital anomalies of genitourinary tract.

MATERIAL AND METHODS

This cross-sectional observational study was carried out at the department of Anatomy of a teaching hospital in Wardha, Maharashtra. Twenty five patients with various congenital defects of genitourinary tract were screened for associated vertebral defect by clinical assessment and spine skiagrams. Equal numbers of controls were also enrolled who underwent X-ray KUB and intravenous pyelography for other indications, to compare with general population. The significant association was analyzed using chi square test and test of significance for proportion i.e. z- value. The study was approved by institute ethics committee and written informed consent was obtained from all the subjects.

RESULTS

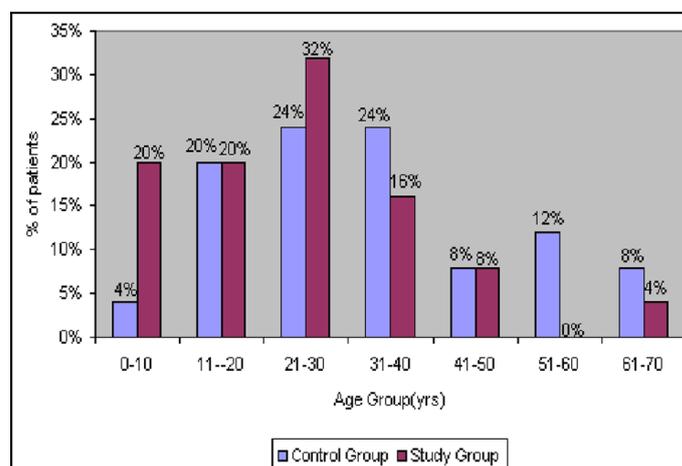
There was no significant difference in the study groups in relation to age [Table/Fig-1] and gender distribution of the subjects. The distribution of various congenital anomalies of urinary tract observed in 25 patients of study group on intravenous pyelograms is given

in [Table/Fig-2]. The vertebral anomalies associated with congenital anomalies of urinary tract, observed in these 25 patients, are shown in [Table/Fig-3].

In the control group single case of sacralization was observed which was bilateral and this difference between control and study group was statistically significant ($p < 0.05$). Scoliosis was observed in 2 cases of control group and 5 cases of study group and bifid spine was observed in 10 patients of which one belong to control group and rest nine belong to study group ($p < 0.05$).

DISCUSSION

The association of congenital genitourinary anomalies with vertebral anomalies has previously also been reported either isolated or as a part of syndromic associations like VACTERL [4,5,6]. The



[Table/Fig-1]: Age wise distribution of patients in study and control group

Genitourinary anomaly	Characteristics	Number of cases
Pelviureteric junction obstruction	Right	4
	Left	5
	Bilateral	1
Malrotated kidney	Left	2
Horse shoe kidney		2
Ectopic kidney	Right	4
	Left	1
Bifid pelvis	Right	1
	Left	1
Ureteral kinking	Right	1
	Left	1
Multicystic dysplastic kidney	Right	1
Hypospadias		1
Total		25

[Table/Fig-2]: Distribution of congenital anomalies in study group.

Congenital Urinary Tract Anomaly	No. of patients	Spine Abnormality
PUJ Obstruction	10	Bifid Spine -3 Unilateral Sacralization -2 Bilateral Sacralization -3 Scoliosis -1
Malrotated Kidney	02	Bifid Spine -1
Horse Shoe Kidney	02	Bifid Spine -1
Ectopic Kidney	05	Lt. sacralization -1 Bilateral Sacralization -3 Bifid Spine -2 Scoliosis -1
Bifid Renal Pelvis	02	Bilateral Sacralization-2 Scoliosis -1 Bifid Spine -1
Ureteral Kinking	02	Scoliosis -1
Multicystic Dysplastic Kidney	01	Bilateral Sacralization -1
Hypospadias	01	Bifid Spine -1 Scoliosis -1

[Table/Fig-3]: Distribution of spine abnormalities associated with various congenital genitourinary anomalies.

most common urinary tract anomalies observed in the present study were pelvi-ureteric junction obstruction followed by ectopic or unascended pelvic kidney which is in contrast to the reports of MacEwen [1] and Vitko [7], who had reported renal agenesis to be commonest anomaly in their series.

The results can also be compared with that of Schey et al [8]. who reported 3 cases of bifid spine in eight patients of renal ectopia in their series. They found no case of scoliosis as well as sacralization associated with genitourinary malformation. Whereas in our study 12 cases of sacralization (3 unilateral, 9 bilateral) and 5 cases of scoliosis associated with urinary tract anomalies were found. No correlation between the side of the spine anomalies and urinary tract abnormalities was observed in our study.

CONCLUSION

The present study highlights the association between genitourinary and lumbosacral vertebral anomalies and emphasize upon the need of thorough search of these associated anomalies in the cases presenting with genitourinary anomalies.

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