

Epidemiology of Hypospadias in North Maharashtra

Anjali M. Chitale¹, Rahul Agrawal², Agraj Mishra²

Author's Affiliation:

¹Professor ²Junior Resident, Dept. of General Surgery, A.C.P.M. Medical College, ACPM Medical College, Dhule, Maharashtra 424001, India.

Corresponding Author:

Anjali M. Chitale, Professor, Department of General Surgery, A.C.P.M. Medical College, Dhule, Maharashtra 424001, India.

E-mail:

Chi1tale@hotmail.com

Received on 01 May 2017

Accepted on 16 May 2017

Abstract

Objectives: Evaluation and prevalence of hypospadias in north maharashtra. *Materials and Methods:* The study was conducted in January 2000 to December 2017 in department of general surgery, ACPM Medical College, Dhule. In OPD and emergency total of 415 patients presented and were admitted and treated. *Results:* Here we compare the prevalence in varying age group and its association with various factors like congenital anomalies, socioeconomic status, its surgeries and related complications, etc. *Conclusion:* This study underlines the epidemiology of hypospadias in rural set up in India, no such study of epidemiology of hypospadias is available in India.

Keywords: Epidemiology; Hypospadias.

Introduction

Birth defects are structural or functional abnormalities that are present at birth and cause physical or mental disability. There are various birth defects involving urethra, hypospadias being one of the most common birth defects among them (second to cryptorchidism), with varying incidence. Of all anomalies associated with ARM, urogenital anomalies are the most frequent.

The incidence of associated UGA from different series varies widely from 25% to 60% often lead to developmental disabilities. Hypospadias being multifactorial in origin, we Indians are more prone for hypospadias. The study was planned to know the epidemiology of hypospadias, in patients attending our tertiary care hospital, in the region of north Maharashtra.

Hypospadias being one of the most common birth defects of urogenital system (second to cryptorchidism) with varying incidences and with special emphasis on the type of hypospadias, incidence of hypospadias, etiology of hypospadias, age at presentation and associated congenital anomalies and with operative outcome.

Materials and Methods

This study was conducted in a rural set-up in north Maharashtra during the period of January 2000 to December 2017. It was a prospective study. All male patients aged between 0 - 20 years with genitourinary complaints of :-

- Abnormal site of urethral meatus.
- Passing urine from undersurface of penis.
- Chordee.
- Hooded penis.

Attending Surgery O.P.D of A.C.P.M. Medical College, Dhule, formed the subjects of our study. Our study included 415 patients. The study included i) all fresh cases of hypospadias at 0-20 years of presentation ii) All fresh cases of hypospadias with Anorectal and Urogenital malformations. Patients with other associated anomalies (cns, cvs, git, etc., Malformations) were excluded from our study. The study protocol was reviewed by the institutional ethical committee of the institution and permitted by it.

The relevant data was obtained from the patients and their parents accordingly, by using a pretested proforma.

All patients included in the study were evaluated on the basis of history, clinical examination, routine investigations and ultrasonographic studies of the KUB region and pelvis for detection of associated urogenital anomalies.

Micturating cystourethrogram (MCU) was done in patients diagnosed with urogenital abnormalities in USG.

Patients diagnosed with hypospadias were operated. Patients diagnosed with proximal hypospadias underwent Staged hypospadias repair, which includes:

1. Chordee correction
2. Urethroplasty.

Patients with distal hypospadias underwent Snodgrass procedure.

All post-op patients were followed up for any complications.

The collected data was analysed and depicted in the form of tables, graphs, charts and figures.

Results

Of 415 patients with hypospadias, 70% were within 0 to 5 years age and 23.5% were 6 to 10 years age group, 5.5% were 11 to 15 years age and 2% 16 to 20 years old.

Birth weight of 38.5% patients was low and 54.4% were normal while 6.9% patients with hypospadias had no information of their birth weight. 24.9% patients with full term and 75.1% were preterm delivered patients developing hypospadias. Only one patient was twin with hypospadias while 99.7% were singleton at time of birth.

At time of birth 5.6% patients mother age was more than 35 years. 15.5% mother were primigravida and

Table 1: Age group wise distribution of patients with hypospadias

Age Group (years)	Frequency	Percent
0 to 5	290	70
6 to 10	97	23.5
11 to 15	23	5.5
16 to 20	05	2
Total	415	100.0

Table 2: Birth characteristics of patients(n=415) with hypospadias

	Characteristics	Frequency	Percent
Birth Weight	LBW	160	38.5
	Normal	226	54.4
	Not available	29	6.9
Gestation Age	Full Term	103	24.9
	Pre term	312	75.1
Gestational Births	Singleton	414	99.7
	Twins	1	0.02

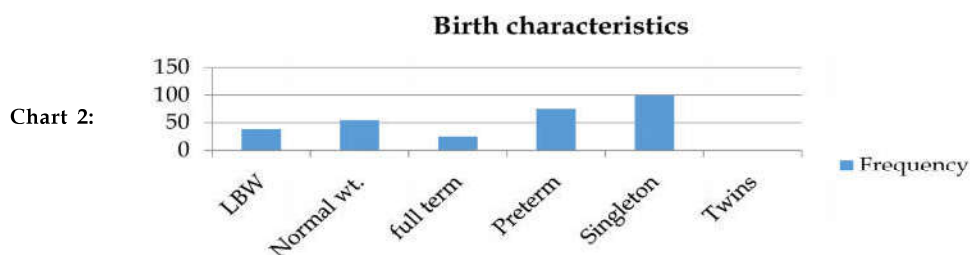
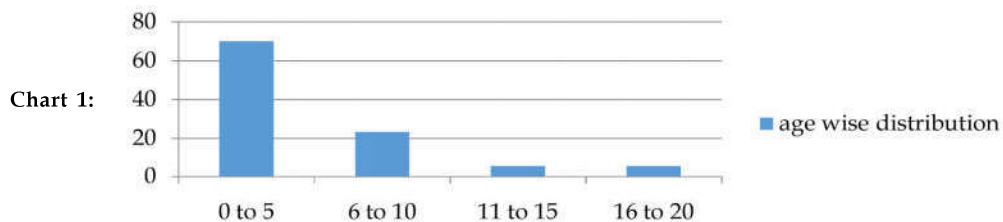
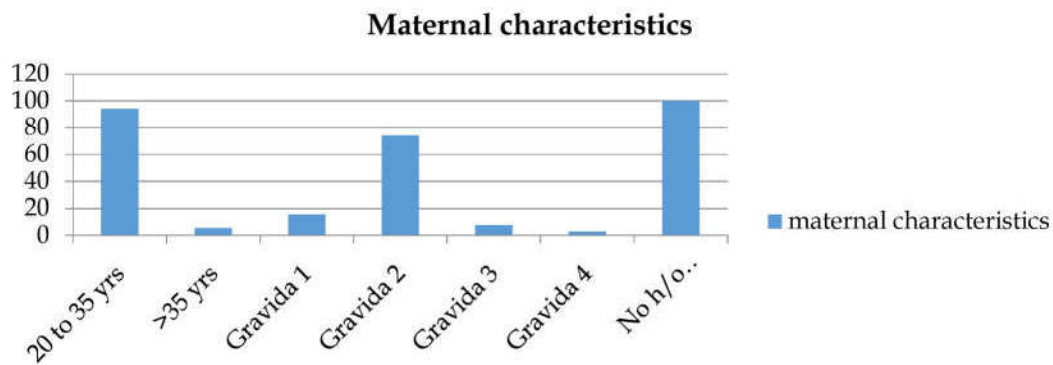
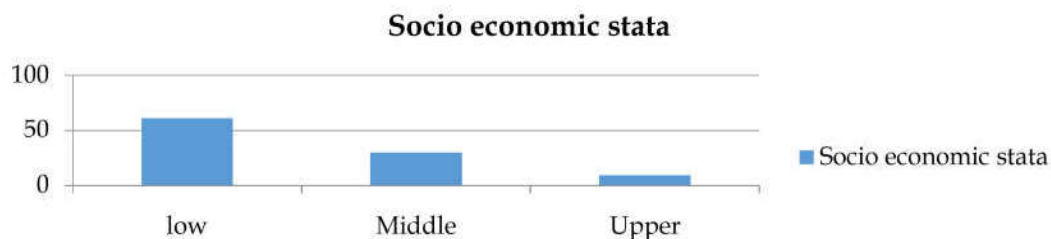


Table 3: Maternal characteristics of patients (n=415) with hypospadiasis

Maternal	Characteristics	Frequency	Percent
Mother Age	> 35 yrs	23	5.6
	20 to 35	392	94.4
Gravida	1	64	15.5
	2	307	73.9
	3	32	7.8
	4	12	2.8
folicacid supplementation	Not available	42	10.1
	No	16	3.8
Maternal smoking	Yes	357	86.0
	No	415	100
	Yes	00	0

Table 4: Environmental characteristics of patients (n=415) with hypospadiasis

	SES	Frequency	Percent
Socioeconomic status	Low	254	61.2
	Middle	123	29.6
	Upper	38	9.2
	Total	49	100.0

**Chart 3:****Chart 4:**

73.9% gravida 2 of hypospadiasis patients. 86.0% mother had history of folic acid supplementation at time of ANC, while all 100% mothers had no history of smoking.

38.8% hypospadiasis patients were from low socio economic status, 49% were from middle and 12.2% were from upper socioeconomic class.

Familial clustering with either one of family member suffering from hypospadiasis was found in 4.3% patients having hypospadiasis. While there was

no history of consanguineous marriage in any one of them.

Pesticide exposure due to occupation was found in 71.6% patients father, while none of patients father had hypospadiasis.

The occurrence of coronal is 26.9%, subcoronal is 1.6%, distal penile is 10.6%, mid shaft is 5.5%, proximal penile is 2.8%. penoscrotal is 46.7% and scrotal and penile is 5.4%.

Of 92 hypospadiasis patients 3 had high type anorectal imperforated anus, 5 patients had low type,

Table 5: Familial characteristics of patients (n=415) with hypospadias

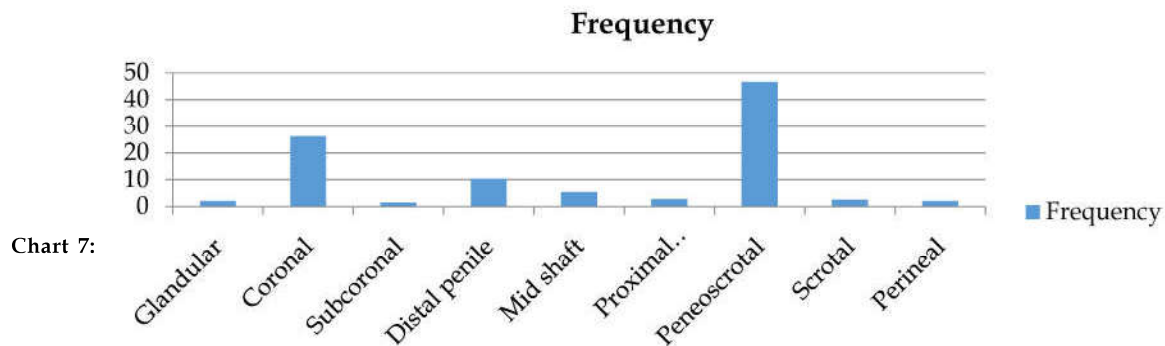
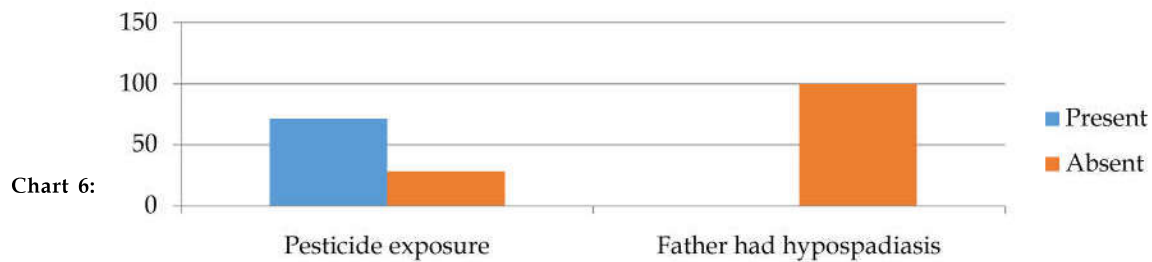
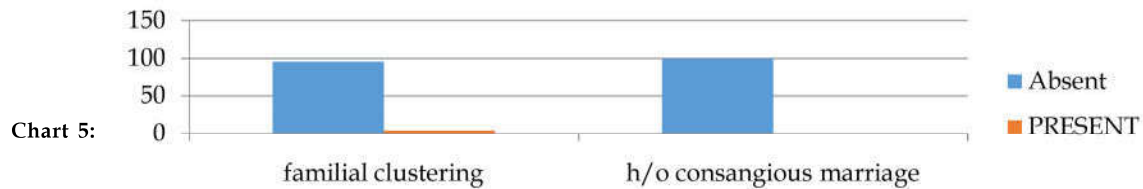
		Frequency	Percent
Familial clustering	No	397	95.7
	Yes	18	4.3
History of Consanguineous marriage	Absent	415	100

Table 6: Paternal characteristics of patients (n=415) with hypospadias

Father		Frequency	Percent
Pesticide exposure	No	118	28.4
	Yes	297	71.6
Hypospadias	No	415	100.0

Table 7: Phenotypic diagnosis of Hypospadias

Diagnosis	Frequency	Percent
Glandular	9	2.1
Coronal	112	26.2
Subcoronal	7	1.6
Distal Penile	44	10.4
Mid shaft	23	5.5
Proximal Penile	12	2.8
Peneoscrotal	194	46.7
Scrotal	11	2.6
Perineal	12	2.1
Total	415	100.0



in 9 cryptorchidism was found, 18 patients had hydrocele, prostatic utricle was associated in 11 patients and hernia in 45 patients.

Of 415 diagnosed case of hypospadias 164 underwent Snodgrass repair, 243 patients had stage surgery.

Out of 415 patients operated for hypopadias, 8.7% developed meatal stenosis and 14.9% had developed

urethrocutaneous fistula. While 76.4% patients with hypopadias had not developed any complication.

Of 172 hypopadias operated by snodgrass repair, 7.9% developed meatal stenosis, out of 243 patients undergone stage surgery 14.4% developed urethrocutaneous fistula and in 76.3% there was no complication.

Table 8: Type of associated anomalies with Hypospadias (n=49)

Associated Anomalies	Frequency	Percent
Anorectal-Imperforated anus High Type	3	0.7
Anorectal-Imperforated anus Low type	5	1.2
Cryptorchidism	9	2.1
Hydrocele	19	4.8
Prostatic utricle	11	2.6
Hernia	45	10.8
Without	323	77.8
Total	415	100.0

Table 9: Operative correction of Hypospadias (n=415)

Operative	Frequency	Percent
Snodgrass Repair	172	41.5
Stage surgery	243	58.5
Total	415	100.0

Table 10: Complication in operated patients of Hypospadias (n=45)

Complication	Frequency	Percent
Meatal stenosis	36	8.7
Urethrocutaneous Fistula	62	14.9
No	317	76.4
Total	45	100.0

Table 11: Complication according to type of operation repair of Hypospadias

Operative Repair	Complication			Total
	Meatal Stenosis	Urethrocutaneous Fistula	No	
Snodgrass Repair	33	02	137	172
Stage surgery	03	60	180	243
Total	36	62	317	415

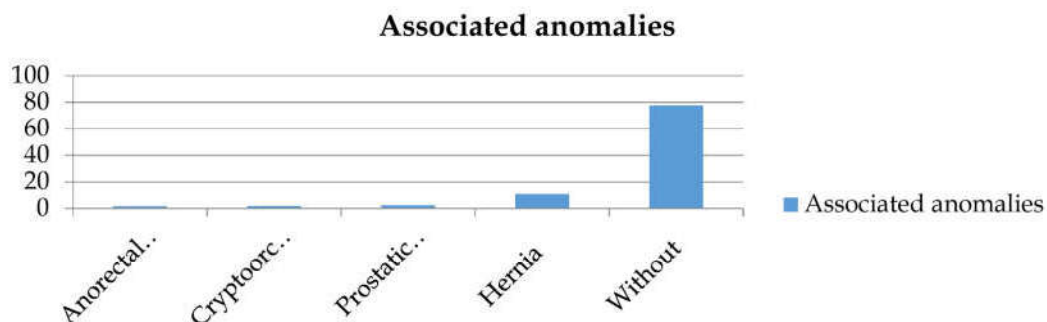


Chart 8:

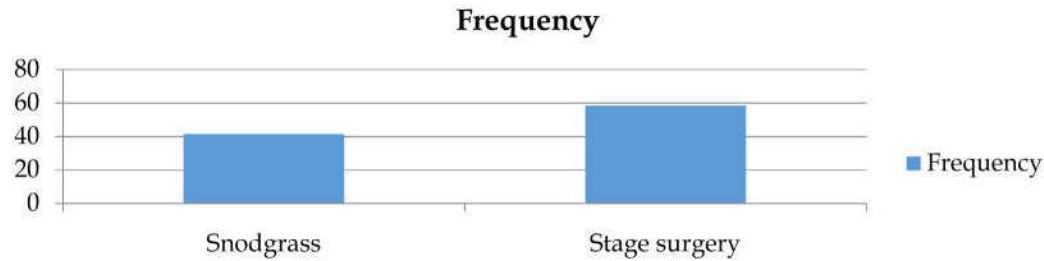


Chart 9:

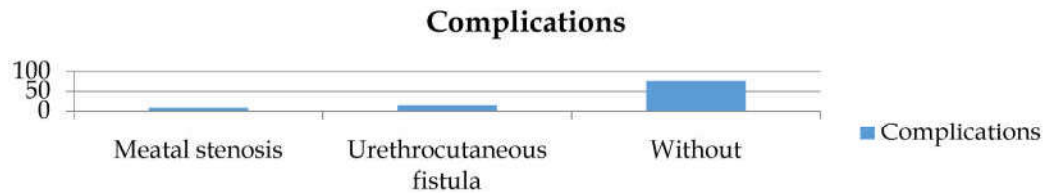


Chart 10:

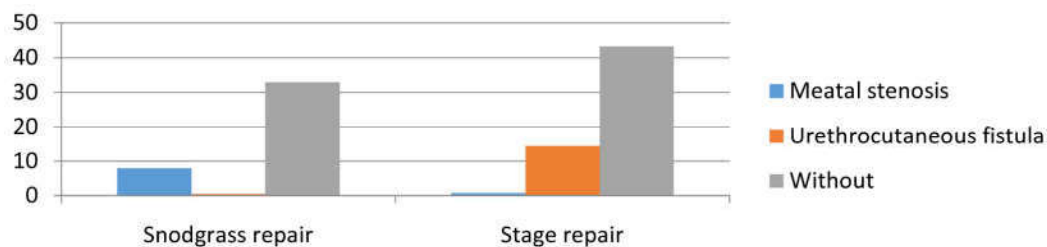


Chart 11:

Discussion

Hypospadias is one of the most prevalent malformations of urethra in man wherein external meatus is situated proximal than normal, over the ventral(under) aspect of the penis. Hypospadias is by far one of the most common urogenital malformation. There are large geographical differences of reported hypospadias cases in varying part of country. Here we discuss about the various incidence and outcome of hypospadias in north maharashtra. However, it is difficult to make comparisons between various parts due to various inclusion criteria and incomplete ascertainment.

Conclusion

Hypospadias incidence report most common seen in age group of 0 to 5 years, about 70% cases reported of same age group. As its a tribal area where patient reports late, so a large no of cases had been reported

in age group of 6 to 10 years and a very few cases had been found in age group of 11 to 20 years.

A large number of cases had been reported in pre term delivered baby, showing incidence to be more common in them. Low birth weight baby had around 38.5% more chance of developing hypospadias. In all the case reported, its shows that the occurrence of hypospadias is most commonly seen in gravida 2 of mother bearing. And it clearly showed that there is no correlation of folic acid deficiency or maternal smoking in development of hypospadias. Familial clustering and consanguious marriage showed no relation in hypospadias development.

It is most commony reported in low socioeconomic status, a very few cases had been reported in high stata group. Most of the cases reported, father had history of pesticide exposure.

Hypospadias had various types based on the opening of external meatus; coronal, penile, peneoscrotal and perineal. Peneoscrotal is most commonly reported type of all, then the incidence shift to coronal and then penile. Few cases of perineal had been reported. Hernia is the most common associated

anomaly with hypospadias independent of type of hypospadias.

There are about 156 operations described for hypospadias, of which stage surgery is most commonly performed, around 59% cases of hypospadias had been treated by stage surgeries and 40% cases had been repaired by Snodgrass. Of all the surgeries performed in various type of hypospadias, 23% had developed complications; in which 15% had urethrocutaneous fistula out of which 14% is treated by stage surgery. In Snodgrass repair, the most common complication was meatal stenosis; a very few meatal stenosis cases had been reported in stage surgery.

References

1. Marvalee H. Wake (15 September 1992). *Hyman's Comparative Vertebrate Anatomy*. University of Chicago Press. pp. 583-. ISBN 978-0-226-87013-7. Retrieved 6 May 2013.
2. Anon. Birth Defects. National Institutes of Health, Eunice Kennedy Shriver, National Institute of Child Health&Human Development. Accessed November 21, 2011.
3. Anon. Birth Defects. Georgia Department of Public Health. Accessed November 22, 2011.
4. Anon. Update on overall prevalence of major birth defects--Atlanta, Georgia, 1978-2005. *MMWR Morb. Mortal. Wkly. Rep.* 2008;57(1):1-5.
5. Mathews TJ, Miniño AM, Osterman MJK, Strobino DM, Guyer B. Annual summary of vital statistics: 2008. *Pediatrics.* 2011;127(1):146-157.
6. Hoekstra WJ, Scholtmeijer RJ, Molenaar JC, et al. Urogenital tract abnormalities associated with congenital anorectal anomalies. *J Urol* 1983; 130:962-3
7. Calzolari, E; Contiero, M R; Roncarati, E; Mattiuz, P L; Volpato, S. "Aetiological factors in hypospadias". 1986.
8. Anon. CDC -Birth Defects, Facts-NCBDDD. Available at: Accessed November 22, 2011.
9. Hoekstra WJ, Scholtmeijer RJ, Molenaar JC, et al. Urogenital tract abnormalities associated with congenital anorectal anomalies. *J Urol* 1983;130: 962-3.
10. Sangkhathat S, Patrapinyokul S, Tadtayathikom K. Associated genitourinary tract anomalies in anorectal malformations: A thirteen year review. *J Med Assoc Thai* 2002;84:289-96.
11. Perspect 107: 297-302, Virtanen HE, Kaleva M, Haavisto AM, Schmidt IM, Chellakooty M, Main KM, Skakkebaek NE, Toppari J. The birth rate of hypospadias in the Turku area in Finland. *Apmis* 2001;109:96-100, Pierik FH, Burdorf A, Nijman JM, de Muinck Keizer-Schrama SM, Juttman RE, Weber RF.
12. Snodgrass, W; Prieto, J "Straightening ventral curvature while preserving the urethral plate in proximal hypospadias repair". *The Journal of Urology.* 2009;182(4 Suppl):1720-5.
13. Stoll, C; Alembik, Y; Roth, M P; Dott, B. "Genetic and environmental factors in hypospadias". *Journal of Medical Genetics.* 1990;27(9):559.
14. Bush, N.; Snodgrass, W. (2014). "Response to "Re: Snodgrass W, et al. Duration of follow-up to diagnose hypospadias urethroplasty complications. *J Pediatr Urol* 2014;10:783-784". *Journal of Pediatric Urology.*
15. Elder JS. Anomalies of the penis and urethra. In: Kliegman RM, Stanton BF, St. Geme JW, Schor NF, eds. *Nelson Textbook of Pediatrics.* 20th ed. Philadelphia, PA: Elsevier; 2016:chap 544.