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Original Article

Sexually transmitted infections in children: a prospective cross-sectional hospital-based study

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Abstract

Objective To study the clinico-epidemiological profile of sexually transmitted infections (STIs) among the children.

Methods It as a cross-sectional hospital-based study. Children (up to 13 years) with suspected STI were included in this study. Diagnosis of STI was done on the basis of detailed history, clinical examination and relevant laboratory investigations.

Results A total of 8,421 STI patients were seen during this period, out of which 57 were children. The commonest STI was seen in the age group of 10-13 years (71.9%). The predominant STIs observed among these children were condyloma acuminata (genital warts) [40.3%], syphilis (14.9%), gonorrhea (13.4%), vaginal candidiasis (13.4%), herpes progenitalis (10.5%), molluscum contagiosum (6.0%) and HIV (1.5%). In majority of cases culprits were family members.

Conclusion Genital wart was the most common STI in children. Vaccination to prevent genital warts should be considered seriously.

Key words
STI, child abuse, condyloma-acuminata, syphilis.

Introduction

Sexually transmitted infections (STIs) are an important cause of morbidity and mortality with the evolution of the HIV/AIDS epidemic, there is a renowned interest in the field of STIs as they can increase a person's risk of acquiring and transmitting HIV by many folds. STIs primarily affect sexually active population in the reproductive age group and are largely acquired through sexual act or close contact with genitals. However, in children the acquisition can be sexual or nonsexual such as accidental contact with secretions or inoculation by a diseased individual. The probability of intrauterine/ perinatal transmission is more likely in children aged less than two years, and a venereal mode of transmission should be considered as the primary mode of transmission for children between 2 and 10 years[1] with sexual abuse as a definite possibility and in children near puberty, voluntary sexual activity and sexual abuse to a lesser extent would be the main modes of transmission. Sexual abuse is a major concern related to STIs in children[2] and is also becoming one of the important factors for acquiring STIs including HIV.

The increasing research over last two decades into the prevalence, childhood correlates and later consequences of childhood sexual abuse has established that exposure to some form of

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unwanted sexual attention during childhood is not uncommon.[3]

Methods

It was a cross-sectional hospital-based study conducted at the STI clinic of a tertiary health care centre, from January 2011 to July 2017. Children with suspected STI were included in this study. Inclusion criteria were children up to 13 years of age suffering with STIs and no topical or systemic drugs within two weeks. Written consent was taken from their parents' in every case. Exclusion criteria were patients more than 13 years and patients suffering with any other genital dermatological conditions. Diagnosis of STI was done on the basis of detailed history, clinical examination and relevant laboratory investigations. ELISA for HIV-1 and 2 and rapid plasma regain (RPR) test in dilution were carried out in all patients to screen HIV infection and syphilis. RPR titer of more than 1:16 was designated as syphilis. A titer of 1:16 was subjected to treponemal test (TPHA) for confirmation and titer below 1:16 were not considered as syphilis. Other tests like Gram's staining (gram negative intracellular diplococci) and culture for *Neisseria gonorrhoeae*; KOH examination for candidiasis (budding yeast like structure and or pseudo-hyphae), Tzanck smear (multinucleated giant cells) and serological HSV-2 IgM and IgG for herpes progenitalis were also performed to help in the diagnosis of different STIs. Family structure and relationship of culprits were also noted. Joint family was labelled when a consanguineous family unit that included two or more generations of kindred related through either the parental or maternal line who maintained a common residence and were subject to common social, economic, and religious status. Pre- and post-test counseling was done in every patient. Their parents were also counseled regarding child care. During the counselling and treatment, privacy of patients was maintained and patients were assured regarding confidentiality of the conversation.

Results

A total of 8,421 STI patients were seen from January of 2011 to July of 2017, out of which 57 (0.7%) were children. Males comprised of 37 (64.9%) cases while females comprised of 20 (35.1%) cases. The age ranged from 3 to 13 years with mean age of 9.76±2 years. The majority of the cases 41 (71.9%) were in the age group of 10-13 years followed by 6-9 years (22.8%) and 3-5 years (5.3%). Forty-one children were from joint family and 16 were from nuclear family structure. In majority of the cases family members were culprit. The most common relationship was cousin 23 (33.3%) followed by brother 12 (17.4%), mixed relations 8 (11.6%), father 4 (5.8%), relatives 3 (4.4%) and others were involved in 19 (27.5%) cases. Type of sexual exposure was heterosexual, homosexual, as well as, bisexual **(Table 1)**. The predominant STIs observed among these children were condyloma acuminata followed by syphilis. The distribution of various STIs is shown in **Table 2**. Mixed infections were found in male and female both. Detail of mixed infections is given in **Table 3**. One female child of 13 year age was seropositive for HIV. Sexual contact was accepted in 94.7%.

Discussion

STIs are generally considered as a problem of sexually active age groups. Sexual abuse against children is not uncommon in our societies. Child sexual abuse (CSA) has been found to be widespread in all nations, although studies have used different definitions of the term.[7,8,9] Evidence of the etiology, prevalence, and sequelae of CSA has grown considerably since the late 1970s.

Table 1 Type of exposure in the study population (n=57).

Type of exposure	*Male (no.)*	*Female (no.)*	*Total (no.)*	*%*
Heterosexual exposure	08	19	27	47.4
Homosexual exposure	25	00	25	43.9
Denial of exposure	02	01	03	5.2
Bisexual exposure	02	00	02	3.51

Table 2 Frequency of different sexually transmitted infections in the study population (n=57).

Infection wise distribution	*Male (no.)*	*Female (no.)*	*Total (no.)*	*%*
Condyloma acuminata	19	08	27	40.3
Syphilis	10	00	10	14.9
Primary	01	00	01	1.5
Secondary	09	00	09	13.4
Gonorrhea	04	05	09	13.4
Vaginal candidiasis	-	09	09	13.4
Molluscum contagiosum	04	00	04	6.0
Herpes progenitalis	07	00	07	10.5
HIV	00	01	00	1.5
Total	44*	23ǂ	67	100

* Seven had mixed infections

ǂ Three had mixed infections

Table 3 Frequency of mixed sexually transmitted infections.

S.No	Infections	Male	Female
1.	Herpes progenitalis with syphilis	2	0
2.	Herpes progenitalis with gonococcal proctitis	2	0
3.	Herpes progenitalis with condyloma acuminata	1	0
4.	Herpes progenitalis with molluscum contagiosum	1	0
5.	Herpes progenitalis with HIV	0	1
6.	Condyloma acuminata with gonococcal vulvovaginitis	0	2
7.	Condyloma acuminata with syphilis	1	0

CSA is form of child abuse in which an adult or older adolescent abuses a child for sexual stimulations. Forms of CSA include asking or pressuring a child to engage in sexual activities (regardless of the outcome), indecent exposure of the genitals of a child, displaying pornography to a child, actual sexual contact with a child, physical contacts with the child genitals, viewing of the child genitalia without physical contact.[10]

The main aim of our study was to determine the STIs in children who are up to 13 year of age. Thirteen years of age is the age of puberty, development of sexual organs and production of sex hormones. After puberty it is very difficult to access a differentiation between the desire/willingness and sexual abuse.

Few studies have been conducted on STIs in children and most have emphasized sexual abuse in detriment to the STIs themselves. A study conducted by Pitche *et al*.[11] (2001) in Togo reported 33 cases of STIs in children up to 11 years of age, emphasizing the role of sexual abuse within this context. In a retrospective study conducted in a specialist clinic in Nigeria, Olayinka and Olayinka[12] (2002) described 102 cases of STIs in children up to 13 years of age who attended consultations within a 12-year period, highlighting the real problem of these diseases in the pediatric population. Likewise, in 2003 Pandhi *et al*.[13] conducted a study in New Delhi, India and reported 127 cases of STDs in children under 15 years of age, showing that children represent a significant subgroup of the population affected by STIs.

Due to sexual abuse of children, STIs have been reported in children in many studies. The prevalence of STIs varies from country to country and from place to place in the same country. In the recent times there has been a steady rise in the STIs in children probably as a consequence of increased premature sexual activity and increased child abuse because of various prevailing misbelieves and myths.[14] The prevalence of childhood STIs in the present study was 0.7%. Similar studies by Pandhi *et al*.[4] and Mendiratta *et al*.[5] reported childhood STIs in 0.82% and 2.5%, respectively. The peak incidence of STIs was seen in the age group of 10-13 years which accounted for 71.93% of cases which is similar to studies by Bhogal *et al*.[6] and Pandhi *et al*.[4] who reported STIs in 66% and 66.1%, respectively, but higher compared to the study by Mendiratta *et al*.[5] who reported in 41.2%. All these studies point to the fact that STIs are increasingly seen among the adolescents. Early-onset of sexual activity along with homosexual and bisexual behavior increases the chances of acquiring STIs including HIV at an early age.

Boys were more commonly affected than the girls, which are similarly reported in the previous studies[6,15,16] because of greater possibility of exploring sexual adventures in the adolescent boys, increasing homosexuality and more conservative upbringing of the girls with a greater regard for moral and ethical issues in them. Majority of children was in the school-going age group, which highlights the importance of an enhanced exposure and risk of acquiring STDs in this age group.

The various factors responsible STIs in children could be low socio-economic status, overcrowding and myths like curing STIs by having sex with a virgin.[6] History of homosexual contact was reported in 24 (42.1%) males. Out of 24, 17 males were above 9 years of age. A study by Mendiratta *et al*.[5] reported that homosexuality was in 11.1% of cases. One female of 13 years was HIV positive and she was victim of child abuse. Thus child abuse is one of the important markers for STIs and HIV in pediatric patients.[17]

In the recent years, there has been a shift in the pattern of STIs from bacterial to viral.[18,19] In the present study also viral STI (condyloma-acuminata) was the commonest STI seen in pediatric patients accounting for 27 (40.3%) cases. Condyloma acuminata shows a rising trend.[20] Out of nineteen males with condyloma-acuminata, history of homosexuality was reported in 12 cases, four cases were of heterosexual, two was bisexual while one denied any history of exposure. Condyloma acuminata was less in female patients. These females may have lesions of wart on cervix or deep in vaginal mucosa. We did not examine cervix because per speculum examination is not advisable in female children.

Syphilis was the second most common STI detected in our study. Acquired syphilis was quite common in the older children i.e. >10 years age. Lowy (1992) emphasized that 95% of acquired syphilis in children is transmitted by sexual abuse and the perpetrator is someone the child knows or trusts. Syphilis cases were found in males only. Of our 10 patients less than 12 years of age with acquired syphilis, most were 4 to 10 years old. A symmetrical macular papular non-itchy rash, which also involved the palms and soles was most frequent (77.8%) presentation; condylomata lata was reported in two (22.2%), and chancre in one case.

No cases of chancroid, nongonococcal urethritis and granuloma inguinale, or lymphogranuloma venereum were observed in the present study.

Knowledge of the characteristics of family structure may be helpful to the pediatrician and venereologist for predicting child abuse. There are increase in teen age pregnancies, unmarried motherhood, divorce rates, and frequencies of unrelated surrogate parents, most often male, cohabitating in the home. In these settings, identifiable characteristics of the mother, the father or surrogate, the child, the family history and the immediate neighborhood of the family have been associated with the greater likelihood of child and/or spousal abuse.[21]

School health programs aiming at safe sexual practices should be strengthened. Comprehensive sex education should be provided to each child. Health education along with behavior therapy and regular screening is required for high-risk groups like street children and children at work. It is of great concern due to high morbidity and mortality of the disease, along with its associated psychological and social stigma. It is important to improve awareness among children, adolescents, parents, and general population. It is also important to improve a more patient friendly health care delivery system where victims get support and treatment, thereby enabling prevention or reduction in STIs among children.

The limitations of the study include a possible bias in results because it was based on the participants attending STI clinic at a single tertiary care hospital. Moreover, the results cannot be generalized to the normal population.

The rise of STIs in children could be related to child abuse, early sexual maturity and activity due to changing societal perspective. Early-onset of sexual activity, lack of knowledge about the disease, practices of high-risk homosexual/ bisexual behavior with multiple partners, and child abuse increase the risk of acquiring STIs and HIV. So, children with STIs should be fully assessed to screen for child sexual abuse or the circumstances which brought in the infection. Evaluation for sexual abuse should be done in all cases.

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