REVIEW PAPER

PEDIATRIC UROLOGY

Urogenital tract disorders in children suspected of being sexually abused

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Introduction Child sexual abuse (CSA) is generally defined as child exploitation that leads to achievement of sexual satisfaction. According to data from European countries, sexual abuse of children affects 10–40% of girls and 5–20% of boys.

Material and methods The Medline, and Web of Science databases were searched with no date limitation on May 2015 using the terms 'child abuse' in conjunction with 'urinary tract', 'urologist', 'urological dysfunction', 'urologic symptoms', 'LUTS' or 'urinary infection'.

Results Awareness of the CSA problem among paediatricians and urologists is very important, because they are often the only physicians who are able to recognize the problem. CSA diagnosis is possible only through the proper collection of a medical history and a thorough physical examination.
Urologists have to remember that children exposed to sexual abuse rarely exhibit abnormal genital findings. In fact, absence of genital findings is the rule rather than the exception. In most cases, the final diagnosis of sexual abuse is based on the child's history and behavior, along with the onset and exacerbation of urologic symptoms.

Conclusions In this article, we present a review of studies and literature concerning urinary symptoms in sexually abused children to clarify the problem for a broad group of urologists. We present common symptoms and premises that can point to the right diagnosis and basic guidelines of proceeding after suspicion of abuse.

Key Words: sex offenses ‹› child ‹› urogenital symptoms

INTRODUCTION

Child sexual abuse (CSA) is generally defined as child exploitation that leads to achievement of sexual satisfaction. According to the 1986 WHO definition, sexual violence against children is described as "obtaining sexual pleasure by adults through child abuse". While being abused, the child is involved in a sexual activity that he or she does not fully comprehend, is unable to give informed consent to, or for which he or she is not prepared for developmentally. CSA includes exhibitionism, pornography, fondling or sexual intercourse. In another report, the WHO declared that the age of victims is decreasing and the scale of the problem is growing [1, 2]. In the U.S., the number of detected and suspected CSA cases was increasing in the 80s by an average of 10% annually. This can be explained by growing public interest in the pathological phenomenon of sexual exploitation and greater public awareness.

MATERIAL AND METHODS

The Medline, and Web of Science databases were searched with no date limitations on May 2015 using the terms 'child abuse' in conjunction with 'urinary

tract', 'urologist', 'urological dysfunction', 'urologic symptoms', 'LUTS' or 'urinary infection'. Autoalerts in Medline were also run, and reference lists of original articles, review articles, and book chapters were searched for further eligible articles. The search was limited to English, Polish and Spanish literature. Articles that did not address the topics were excluded, and the full text of the remaining articles was reviewed.
In this article we present a review of studies and literature concerning urinary symptoms in abused children to clarify the problem for a broad group of urologists. We present common symptoms and premises that can point to the right diagnosis, and basic guidelines of proceeding after suspicion of abuse.

DISCUSSION

According to data from European countries, sexual abuse of children affects 10-40% of girls and 5–20% of boys [3, 4]. In Poland, 14.4% of girls and 3.9% of boys experienced sexual exploitation [5]. Girls are abused more often when compared to boys, however, the abuse towards boys is more often associated with physical violence. Boys also experience more severe forms of CSA. Most children, that is 75% to 85%, are abused by a male perpetrator known to the child. The majority of victims describe a single type of sexual activity, but over 20% have experienced multiple types of forced sexual acts [6].
Confirmation of possible CSA is rarely a direct reason for a child to visit an urologist. More frequently children are referred to a urologist because of urogenital system complaints, such as recurrent infections, hematuria, dysuria, chronic pain in the lower abdomen, urinary retention, daytime and nighttime incontinence or LUTS symptoms like, nocturia, urinary frequency, painful voiding or urgency. Pediatricians and urologists who routinely see patients with voiding problems are in an exceptional position to identify children who have been victimized. It is necessary to maintain a high level of vigilance because physical findings may not be easily detectable. Any suggestion given by a child should raise the level of concern that sexual abuse has occurred, because children very infrequently feign stories of sexual abuse. In a study examining 551 cases of CSA reported in the U.S., only 8 cases (1.5%) were deemed false accusations of sexual abuse [7].
Studies concerning urinary symptoms in sexually abused adults confirm an association between the occurrence of sexual exploitation and urological symptoms [8–10]. A similar observation concerns people with urinary symptoms and posttraumatic stress disorder [11, 12]. However, only a few papers were published about children and some have failed to demonstrate a statistically significant association (Table 1). Yet, urinary symptoms are often present in children exposed to sexual violence [9, 13–16]. In the pediatric population which has not been exposed to sexual abuse, urinary symptoms are reported in about 2–9% of children. They include daytime incontinence in 2.1–3.1% of children, urgency in 1.3–4.7% and nighttime incontinence in 1.5–8.9% [4, 5, 17, 18]. One recent study, conducted on 1280 children, has shown that prevalence of enuresis was increased in children with allegations of sexual abuse when compared to the general pediatric population and concerned 13% of 5–9 year olds, 14.7% of 10–16 year olds and 18.2% of 17–18 year olds [19]. Another study has shown that young rape victims were 2.7 times more likely to have pelvic floor dysfunction, including lower urinary tract disorders, than non-victimized controls [20]. Another study conducted by Yildirim et al., presented an incontinence rate of 30.76% and 23.3% in the sexually abused group and in the control group, respectively. However, the difference was not statistically significant. Additionally, rates of daytime incontinence, nocturnal enuresis, diurnal incontinence, urgency, and continence maneuvers were 25.7%, 17.1%, 22.9%, 42.9%, and 20%, respectively, in the sexual touch group, while they were found to be 5.9%, 0%, 0%, 17.6%, and 5.9%, respectively, in the sexual penetration group [4]. Klevan et al. showed that in a group of 428 sexually abused children, 20% of the victims complained of one or more genitourinary symptoms [15].
Kelly et al. in a large report from New Zealand reviewed 2310 cases. The authors showed that 62,9% of children had physical symptoms, 2.8% had abnormal genital findings, 2.5% had urinary tract infections and 1.9% contractd sexually transmitted infections [21].
A study conducted by DeLago et al. showed that in a group of 161 abused girls, 59.6% reported urogenital symptoms. Among those who reported urogenital symptoms, 53.4% reported genital pain, 37.7% reported dysuria and 10,6% reported bleeding after inappropriate genital contact. In contrast to their daughters, parents/guardians reported knowledge of 17.4% cases of genital pain, 18.6% of dysuria and 4.3% of genital bleeding. In the same group, occurrence of dysuria was described in 47.7% and pain in the genitalia region in 71.6% of female minors who were subject to sexual violence with genital-genital contact. In girls who were abused by other types of contact (digital-genital, oral-genital, object-genital), dysuria and pain occurred in 24.7% and 31.5%, respectively [22].
In another study comparing urogenital symptoms after sexual abuse vs. irritant genital exposure,

Table 1. *Studies concerning genitourinary symptoms in sexually abused children*

Author	Number of children	Girls/boys	Age	Abnormal genital findings	Genitourinary symptoms	Dysuria	Enuresis	Vulvovaginitis	Incontinence	Urgency	Sexually transmitted infection	Infection
Anderson [8]	1280	938/342	6m–18y	65.3%	–	–	13–18%	14%	–	–	–	–
Yildirim [4]	52	44/8	Mean 12.2y	–	–	–	17.1%	–	30.76%	42.9%	–	–
Klevan [9]	428	–	–	–	20%	–	–	–	–	–	–	0.5%
DeLago [10]	161	161/0	3y–18y	–	60%	37%	–	–	–	–	–	–
DeLago [11]	64	64/0	5–12y	–	53%	45%	–	–	–	–	–	–
Kelly [12]	2310	1975/ 335	1m–17y	2.8%	62.9%	–	–	–	–	–	1.9%	2.5%

DeLago presented that significantly more girls in the sexual-abuse group (76%) compared to girls in the irritant exposed group (24%) used negative words such as uncomfortable, bad, or hurt, to describe how the contact felt. Additionally, significantly more girls in the sexual-abuse group (69%) said this contact bothered her body and her feelings compared to only 6% of the irritant exposed group. Thirty- three per cent of girls from the sexual-abuse group stated reported dysuria after being touched on the genitalia compared to 12% of the irritant exposed girls [23].

The described relationship between the urinary symptoms and sexual abuse occurrence was previously connected to psychological rather than physiological abnormalities. Frewan reported improvement in urinary symptoms after psychotherapy plus bladder training [24]. Macaulay and et al. reported that sensory urgency, detrusor overactivity, and incontinence could be cured by intense psychotherapy even without bladder training [25]. However, recent researches on neurobiological basics such as stress and anxiety show that these phenomena directly affect the miction mechanism. It occurs due to modulating function of neurotransmitters such as corticotrophin-releasing factor in the nervous system and in the urinary tract [26, 27, 28]. It has also been proven in animal models that stress increases muscarinic-induced contractile responses in the bladder [29].

The results of these studies suggest that the urologic effects of CSA experienced in childhood may persist into adulthood and that the urologic sequelae of CSA may not resolve with psychiatric counseling alone.

Urological treatment should be symptomatic and consist of timed voiding, double voiding, voiding diaries, improved bowel habits, anticholinergics, antimuscarinics and clean intermittent catheterization, as necessary.

The studies mentioned above suggested also that direct treatment of urologic symptoms (e.g. urinary incontinence and urinary urgency) using available behavioral methods, in addition to the direct treatment of psychological symptoms of CSA (e.g. depression, anxiety, poor self-esteem) may result in symptom improvement and thus, presumed improvement in overall quality of life.

The investigators reported resolution or improvement in symptoms for most patients for which they had follow-up data. The length of follow-up or the duration of symptom improvement was not provided.

When sexual abuse is suspected it is important to properly collect the patient's medical history and to implement an appropriate examination. It is often expected that a doctor should diagnose sexual abuse only after performing basic examination of a child. However, this is usually difficult. Tissue damage heals quickly, the child frequently presents with a delay, and furthermore, many forms of sexual harassment do not cause any physical damage. Therefore, a carefully and properly collected medical history is of the utmost importance. Questions about frequency of urination, presence of pain during miction, urgency, diurnal and nocturnal incontinence should be the routine when sexual harassment is suspected.

It is generally difficult for a child to disclose secrets, especially those concerning sexual abuse details. This is due to the fact that the abuse often happens inside the child's family or by trusted persons in the child's life. Additionally, child usually feels responsible for what has happened and fears hurting others, causing trouble, and not being believed. The environment where the examination and interview are conducted should be private, quiet, and familiar to the child. A physician should not judge a child, but support him or her. The conversation should begin with subjects that are interesting for the child and questions should be matched to the child's age. The examiner should be patient and friendly and spend time getting acquainted with the child in order to establish the desired level of trust. The interview should be conducted with the child alone [30, 31, 32]. A study on the effectiveness of various types of dialogue with sexually abused children revealed that asking 'how' questions, similar to the opening question "How did that make your [girl's word for genitalia] feel?", were especially productive [33]. During the conversation some nonspecific behaviors

including suicide gestures, fear of an individual or place, nightmares, sleep disorders, regression, aggression, withdrawn behaviour, depression, anxiety, promiscuity, general behavior problems, poor self-esteem, poor school performance, self-mutilation, phobias, eating disorders should arouse suspicion [30, 34, 35].

Additionally, while the child's confession is important, the manner in which the child's confession was expressed is also essential [36]. It is critical to document the attitude of the child regarding suspicious events. The statement should be documented literally, because it can then be used during court proceedings. Another challenge for clinicians is validation of allegations of sexual abuse. Avoidance of guiding questions and communication with patients using their words and phrases, irrespectively of their correctness, helps to establish the validity of abuse allegations. Nevertheless it must be noted that about 90% of sexual abuse claims turn out to be true, so an assumption of their authenticity is obligatory and requires providing all forms of assistance to the victim with further assessment of the statement veracity [37].

Knowledge of normal anatomy of children's genitalia is crucial in identifying any deviations from the norm. It should be mentioned that until the 80s of the last century, there was no proper description of the state of the external genitalia and perineum/anus area in children before puberty [38, 39].

Complete physical examination should be performed each time a minor is examined. The examination begins with an evaluation of the child's general appearance, hygiene, and nutritional status. It is important to carefully inspect the mouth, neck and throat. After oral-genital contact, skin and mucosae damage and bruising, as well as disruption of the oral cavity frenula may appear. Strangling marks or bruising on the neck indicates brutal assault. In boys, the thighs, penis and scrotum should be carefully examined in search of bruises, scars, scratches, suction ecchymoses, bites marks and pathological secretions. Bite marks are common in sexual assaults and it is important to measure and photograph them carefully to allow matching or exclusion of the teeth of the alleged assailant. Torn frenulum or fracture of tunica albuginea, a so-called 'penile fracture' accompanied with hematoma can, in the absence of history pointing to other causes of trauma, indicate sexual abuse of boys. In girls, the breasts, inner surface of the thighs, labia minora, labia majora and their posterior commissure, urethral orifice, hymen and its opening have to be examined. Vesicovaginal or rectovaginal fistula may be caused by the long presence of a foreign body in the vagina. Symptoms that also indicate sexual exploitation include recurrent urinary tract infections or encopresis. In girls, fresh/healed hymen damage, vaginal mucosa injury or/and vulvovaginitis can be present. In both sexes the perineal and anal area should be carefully examined for presence of any cracks, fissures, scars, hyperpigmentation, skin thickening, warts or other skin irregularities. Anal sphincter muscle tension also has to be assessed. Yet, in many children, despite a history indicating anal manipulation, results of physical examination of both the anus and rectum are normal. Bleeding from the urethra in both sexes may be associated with penetration of the urethra by foreign bodies [14, 19, 34, 40, 41, 42]. Unfortunately, the physical examination is most often normal. Abnormal genital findings are not common in sexually abused children [43]. It was proven that less than 5% of girls who disclose sexual abuse have physical examination findings or laboratory evidence that confirms this diagnosis [44].

It is important to collect a proper medical history, because aforementioned symptoms and findings can be related to genital irritant exposures (soap, shampoo), tight nylon underwear, bike or horse riding or accidental genital trauma. However, both conditions can coexist, thus it is important to ask caregivers and children themselves about genital exposures to products, activities, and conditions thought to cause symptoms and about past histories of urogenital symptoms and what they think caused the symptoms [23].

An infant girl can be examined either on the examination table or while on a parent's lap. A vaginal inspection in older girls may be performed in a supine recumbent position, with the knees flexed and the heels against the buttocks (the frog-leg position) or knee-elbow position with the face looking down [34]. An examination of boys can be performed with the patient in the sitting, supine or standing position [45, 46]. Evaluation of the anus may be performed with the patient in the supine, lateral recumbent or prone position with gentle retraction of the gluteal folds [34].

Another symptom, which is worth mentioning, is the presence of sexually transmitted disease/infection (STD). In children, existing infection may be related to prolonged colonisation after perinatal acquisition, inadvertent non-sexual spread, prior peer sexual activity, or in many cases to sexual abuse. It is believed that approximately 70–75% of pediatric patients with documented sexually transmitted disease may have been exposed to sexual abuse. The peak incidence of venereal disease in abused children is recorded to be between 10 and 14 years of age [5]. Human papilloma virus, human immu-

nodeficiency virus, syphilis, *Trichomonas vaginalis, Chlamydia trachomatis,* herpes simple virus infection can be perinatally acquired and do not always indicate sexual abuse. However, *Neisseria gonorrhoeae* infection, the most frequent STD found in abused children and reported to occur in 1–30%, of cases is probably the most useful indicator of sexual abuse. Gonorrhoeal infection in a child, who has not yet reached sexual maturity, is almost always associated with a history of sexual abuse [6, 47, 48]. The incubation periods for sexually transmitted infections range from a few days for *Neisseria gonorrhoeae* to several months for human papilloma virus. The incubation periods and timing of an examination after an episode of abuse are critically important in detecting infections and confirming abuse [6].

CONCLUSIONS

Awareness of the CSA problem among paediatricians and urologists is very important, because they are often the only physicians who are able to recognize the problem. CSA diagnosis is possible only through the proper collection of a medical history and a thorough physical examination.

Urologists have to remember that children exposed to sexual abuse rarely exhibit abnormal genital findings. In fact, absence of genital findings is the rule rather than the exception. In most cases, the final diagnosis of sexual abuse is based on the child's history and behavior, along with the onset and exacerbation of urologic symptoms.

Guidelines for the medical care of children suspected of being sexually abused recommend collecting a medical history concerning anogenital pain, bleeding, itching, discharge, or dysuria, but little has been published to describe the type and frequency of urogenital symptoms and signs reported by children after sexual abuse. A few of the above discussed studies draw more attention to functional disorders of the lower urinary tract in sexually abused children. Therefore the possibility of sexual abuse must be considered not only in case of genito-urinary trauma but also dysuria, chronic pain in the lower abdomen, urinary retention, daytime and nighttime incontinence or LUTS symptoms like, nocturia, urinary frequency, painful voiding or urgency. Testing for STDs is not recommended as a common clinical practice, because the incidence of sexually transmitted diseases among victims of CSA has been observed to be low. STD testing should be considered in children who are symptomatic and in those with a high possibility of having oral, genital, or anal contact with the perpetrator. On the contrary it should be noted, that the presence of non-perinatally acquired gonorrhea, chlamydia, human immunodeficiency virus, or syphilis is considered diagnostic of sexual abuse and warrants immediate reporting to child protective services, regardless of additional evidence of CSA. In all patients, perforimg urodynamic tests and an ultrasound for the assessment of urinary volume after voiding is recommended for detecting voiding dysfunctions and in order to choose an appropriate therapy.

CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

The authors have read and complied with the journal's policy on ethical consent and the standards of animal care.

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