IJMS
Vol 41, No 4, July 2016

Original Article

Diagnostic Value of the Urine Mucus Test in Childhood Masturbation among Children below 12 Years of Age: A Cross-Sectional Study from Iran

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Received: 31 August 2014
Revised: 11 November 2014
Accepted: 14 December 2014

Abstract

Background: Childhood masturbation (CM) is considered a variant of normal sexual behavior; however, it is commonly misdiagnosed as epilepsy and movement disorders. As the first study from Iran, we analyzed a large population of infants and children with CM in a case-control study and evaluated the value of mucus in urine analysis as an alternative diagnostic tool for CM.

Methods: A total of 623 children referred to the Pediatric Neurology Clinic of Imam Khomeini Hospital for an evaluation of seizure or movement disorders were studied between 2008 and 2011. Totally, 359 children were found to have masturbatory behaviors (Group A) and the rest (264) were assigned to Group B. CM was diagnosed by direct observation. Collected data comprised demographic characteristics, clinical and neurodevelopmental examinations, laboratory findings (particularly urine analysis), and electrocardiography.

Results: The age of the children with CM was below 12 years old, and the girl-to-boy ratio was 7:1. Mucus in urine was positive in 357 (99.44%) children in Group A and 22 (8.3%) in Group B ($P<0.001$). A significant correlation was found between the presence of mucus in urine and masturbatory behaviors ($P<0.001$).

Conclusion: Our findings suggest that the presence of mucus in urine can be used as an alternative laboratory test in children with CM below 12 years old and even in infants (≤24 months old). Further studies are needed to confirm the results.

Please cite this article as: Keihani Doust Z, Shariat M, Zabandan N, Tabrizi A, Tehrani F. Diagnostic Value of the Urine Mucus Test in Childhood Masturbation among Children below 12 Years of Age: A Cross-Sectional Study from Iran. Iran J Med Sci. 2016;41(4):283-287.

Keywords ● Childhood masturbation ● Mucus ● Urine

What's Known

- Childhood masturbation is commonly recognized as a variant of normal behavior and can occur at any age.
- Sometimes it is commonly misdiagnosed and treated as epilepsy, movement disorders such as dystonia or dyskinesia, abdominal pain, or colic.

What's New

- The present study analyzed one of the largest series of these children and is the only report from Iran.
- Presence of mucus in urine can be used as an alternative laboratory test in childhood masturbation in children below 12 years old and even in infants (≤24 months old).

Introduction

Masturbation is considered a normal sexual behavior and occurs in 90–94% of males and 50-60% of females at some point during their lives. However, masturbatory behaviors in children and infants area less commonly addressed issue in the literature and most findings are form case reports or case series. Childhood masturbation (CM) or gratification disorder, first described in 1909 by Still, is characterized by the stimulation of the genitalia and has been reported to begin at 2 months of age with a peak of

occurrence at 4 years and adolescence. Some reports have pointed to cases with in-uterine period masturbation.[1-3] The diagnosis of this condition is difficult since masturbatory activity in this age group usually does not involve genital manipulation. The most commonly reported manifestations of CM include dystonic posture, grunting, rocking, facial flushing and sweating, friction of thighs, and pressure on the perineum. Although there are no definite criteria for the diagnosis of CM, studies have reported several common features in these children such as no alteration in consciousness, cessation with distraction, normal examination, normal electrocardiography (EEG), and normal neuroimaging.[4,5] The concept of CM is deemed a normal behavior by many authors, although the boundary between normal and abnormal conditions as well as the role of environmental and individual factors is unclear. Genital irritation due to any causes as well as sexual abuse is well-determined associations.[6] The onset of CM is reported to be associated with a genitourinary tract infection or a stressful life event, and sleep difficulties have been more common among these children.[7-9] One study reported a low estradiol level as a possible association.[10]

CM is commonly misdiagnosed as epilepsy, movement disorders such as dystonia or dyskinesia, abdominal pain, or colic. Children may be referred due to suspected seizures or movements by other physicians or description of "strange episodes or attacks" by parents. Reports show that many of these children have undergone extensive investigations such as magnetic resonance imaging, electroencephalography (EEG), intravenous pyelography, small-bowel biopsy, and gastrointestinal barium swallow and some cases have been treated with antiepileptic agents before the establishment of a diagnosis.[11-13]

Direct observation is crucial for identifying the masturbatory behaviors in children. Several studies have suggested home video taping as a helpful tool in making the diagnosis.[14,15]

Management mostly involves offering parents reassurances and education regarding modification methods.

We have followed up children with masturbatory behaviors and collected data for the past 3 years. This study is the first and only study in Iran to investigate the largest series of CM cases. We aimed to probe into the association between the presence of mucus in urine and CM in otherwise healthy children and evaluate its value as a diagnostic test. We also sought to determine the demographic and clinical characteristics of these children.

Patients and Methods

This cross-sectional study recruited all outpatient infants and children suspected of seizure or epilepsy referred to the Pediatric Neurology Clinic of Imam Khomeini Hospital, a major referral university hospital in the Iranian capital, Tehran, between June 2008 and September 2011. The diagnosis of gratification disorder was established through direct observation during hospitalization or home video tapes.

Of 623 children referred to the clinic within the study period, 359 were found to have CM and were considered Group A. The rest of the children (n=264) were diagnosed with various other disorders and were assigned to Group B. Informed written consent was obtained from the parents, and the study protocol was approved by the Ethics Committee of Tehran University of Medical Sciences.

The diagnosis of masturbation was made if the child had several episodes of at least one of the following characteristic masturbatory activities, provided the cessation of the episode with distraction and no change in consciousness: 1) color change as flushing and sweating, 2) extremity posturing such as arm twisting or extension, clenched fists, hip flexion or extension and/or hip adduction, and pressing the suprapubic region against something or applying manual pressure, 3) head and neck posturing such as staring, neck twisting, and open mouth, and 4) vocalization as quiet grunting and/or heavy breathing and tachypnea.

Masturbatory behaviors in the children were observed, and the presence of each of these 4categories of activities was recorded. Accordingly, each child had a score of masturbatory activity from 1 to 4. The rest of the collected data included demographic characteristics, a detailed history, complete clinical and neurodevelopmental examinations, laboratory findings (particularly urine analysis), and EEG.

Patients with developmental delay, any Tanner stages of puberty, neurodevelopmental disorder, urinary tract infection (positive urine culture), or kidney stone were excluded from the study. A clean-catch urine sample was collected from each child for analysis and culture after the diagnosis of masturbation was confirmed.

Statistical analysis was performed using Statistical Package for the Social Sciences (SPSS), version 16. The results are shown as mean±standard deviation (SD).

Fisher's exact test was used to compare the study parameters between the 2 groups, and

the Pearson's correlation test (Cohen's kappa [κ] values) was utilized to determine the association between mucus in urine and the clinical findings of masturbation (the score of the masturbatory activity). A P<0.05 was considered statistically significant.

Results

Data on 623 children below 12 years of age and at a mean age of 40 months (359 in Group A and 264 in Group B) were analyzed. The demographic characteristics of the 2 groups are summarized in table 1.

There were no significant differences between the 2 groups regarding these characteristics.

Mucus in urine (microscopic finding) was positive in 357 (99.44%) of the 359 children in Group A, while only 22 (8.3%) of the 264 children in Group B were mucus positive in urine analysis.

A significant correlation was found between the presence of mucus in urine and the 4 main categories of masturbatory behaviors (P<0.001). The mean score of masturbatory activities was 1.24±0.50 in the infants (≤24 months old) and 1.40±0.63 in the children (>2 years old). EEG was found to be abnormal (pike slow, 2-3 HTZ and multi-spike pattern=abnormal EEG) in 201 of the 359 children (55.98%) in Group A and in 131 of the 264 children (49.62%) in Group B. No significant correlation was seen between abnormal EEG and masturbatory behaviors (P=0.32). Masturbation was mostly performed in prone and lateral decubitus positions in both of the children and infants. The most common category of masturbatory activity was self-manipulation in the children and the seizure-like pattern in the infants. Age was not associated with the masturbation score or the existence of any of the 4 main categories of masturbatory activities (P=0.15 in the infants <24 months old and P=0.93 in the children >24 months old).

In addition, no relation was seen between sex and the masturbation score (P=0.88 in the male infants <24 months old and P=0.47 and in the male children >24 manths old). The coexistence of seizure was not associated with any of the study parameters.

Discussion

CM is commonly recognized as a variant of normal behavior and can occur at any age. However, its diagnosis is difficult due to a variety of manifestations which can be misdiagnosed as several other medical disorders as well as the absence of typical genital manipulation in this age group.[2,4] The present study analyzed one of the largest series of these children and is the only report from Iran. To the best of our knowledge, this is the first study to assess the diagnostic value of a laboratory test in this condition.

Three groups of children with masturbatory activity have been referred to us during the past3years in the Pediatric Neurology Clinic of Imam Khomeini Hospital: children with only masturbatory behaviors, children with suspected seizures or movements with normal EEG, and finally children with epileptic movements and abnormal EEG. All the 3 groups of children had something in common: mucus in urine.

The mean age in the 359 children with masturbation in our study was 40 months. Most of the subjects were older than 2 years, with a peak at 3.5 years. In addition, the score of masturbatory activity was higher in the children older than 2 years. The age distribution of our study group is consistent with that in previous studies.[8,10,16,17] It seems that children aged between 3 and 4 years begin to explore their body and learn that the stimulation of the genitalia provides a pleasurable sensation, hence the peak of this diagnosis at this age group. They might continue this experience through life.

Although definite conclusions on sex differences in CM are difficult to make, in general it is believed that females masturbate less often than do males. However, in several previous

Table 1: Characteristics of the two groups

Variables	Group A Infants<24	Group B Infants<24	P value	Group A Children>24	Group B Children>24	P value
Number (%)	42 (11.69%)	43 (16.28%)		317 (88.30%)	221 (83.71%)	
Age (mean+SD)	12.98±6.37 months	15.34±5.99 months	0.15	5.97±2.50 years	5.70±2.25 years	0.93
Male (N[%])	18 (42.9%)	18 (41.90%)	0.88	195 (61.5%)	123 (55.7%)	0.47
Female (N[%])	24 (57.1%)	25 (58.10%)		122 (38.5%)	98 (44.3%)	
Seizure [N (%)]	24 (57.1%)	36 (83.7%)	0.0001 OR,2.34 CI,1.22 to 5.64	177 (55.8%)	95 (43%)	0.06
Mucus positive (N[%])	42 (100%)	2 (4.7%)	0.0001 OR,20 CI,18.51 to 46.99	315 (99.4%)	20 (9%)	0.0001 OR,11 CI, 5.89 to 20.52

studies, masturbation was more frequently reported in girls than in boys.[4,6,8] In our study, the female-to-male ratio was 7:1. It is not possible to conclude a higher prevalence of CM in girls only due to clinical/epidemiological findings of small series, particularly since several factors such as social and cultural beliefs and anatomical differences may play a role in these reported sex differences. It may be assumed that masturbatory behaviors in boys create less worry in parents to seek medical help due to the cultural and social backgrounds; this creates the referral bias, which can be more dominant in small study populations.

Epilepsy and CM may coexist, which will render the diagnosis even harder.[17-19] In our study, 201 of the 359 children were proved to have simultaneous epilepsy by EEG. Nonetheless, the rest of the case group commonly had been previously misdiagnosed as epilepsy and movement disorders, with many of them being already on antiepileptic medications. Consistently, other studies have reported frequent cases of CM misdiagnosed as epilepsy and some other medical disorders. Misdiagnosis is mostly due to the nonspecificity of the presentations as there may be merely repeated adduction of thighs or episodes of staring, shaking, or eidetic imagery or unvocalized speech with imagery individuals. Infants may seem unhappy during the episode and their jerky spasms may cause confusion with epileptic infantile spasm.

Clinicians should include CM in the differential diagnosis of children referred for an evaluation of suspected seizure, epilepsy, or movement disorders or any strange behavior described by parents. Normal EEG during the fits, lack of response to antiepileptic agents, reviewing videotape recordings, and obtaining detailed history may shed light on the diagnosis of seizure-like episodes as masturbatory behaviors. This may prevent the unnecessary extensive investigations to which many of these children have been subjected in the past before the establishment of the diagnosis of CM. Once the diagnosis is made, management will be as simple as offering reassurance to the parents and providing them with education about the condition and behavior-modification methods.

Apart from analyzing the epidemiological and clinical characteristics of the children with CM, we also tested a hypothesis in our study based on the author's years of clinical experience about this concept. We examined the association between the presence of mucus in otherwise normal urine analysis and CM to see whether it can be used as a complementary diagnostic test in this condition. Mucus in urine may be positive in other clinical conditions such as urinary tract infection and stones, which were ruled out in our study. Secreted from the vesical glands of the genitourinary tract, mucus in not generally seen in the urine samples of children under the age of 12. According to our findings, the frequency of positive mucus in urine was significantly high among the children and infants with CM when compared with the other group. Moreover, it was significantly correlated with the presence of masturbatory behaviors in the 4 studied categories.

Considering the direct observation of the mentioned masturbatory activities as the main method for the definite diagnosis of CM,[20,21] urine mucus tests were found to have a high value.

It is deserving of note that all the children with CM were set up for follow-up visits; however, the noncompliance of the parents precluded a sufficient data collection for analysis and report. Nevertheless as a whole, it was observed that parental education and instructions such as changing diapers more frequently, using cotton underwear, and distracting the child and engaging him/her in other activities during the episodes led to a reduced occurrence of the condition in most of the followed cases and the urine mucus test was found to become negative in all the cases in whom the masturbatory behaviors were stopped completely due to the parents' report.

Conclusion

Our findings suggest that the presence of mucus in urine can be used as an alternative laboratory test in CM in children below 12 years old and even in infants (≤24 months old). Further studies are needed to confirm the results.

Acknowledgement

The authors would like to thank the personnel at EEG Center (Vali-Asr Hospital) for their kind collaboration.

Conflict of Interest: None declared.

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