Brief communication

Do pediatric chief residents recognize details of prepubertal female genital anatomy: a national survey

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Received 31 May 2001; received in revised form 21 February 2004; accepted 5 March 2004

Abstract

Objective: To evaluate how well a group of recently trained pediatric chief residents could label anatomic structures on two different photographs of female prepubertal genitalia. Additionally, the study sought to explore aspects of pediatric training in sexual abuse and clinical practice issues surrounding the routine genital examination.

Method: A 38-item questionnaire was mailed to pediatric chief residents at all of the officially listed pediatric residency-training programs in the continental US. Comparisons were made between this study and the responses to two previous surveys, which asked a more heterogeneous group of physicians to label one of the photographs used in the study. The second photograph was added because of its improved clarity of each anatomic structure when compared to the first photograph used in the previous studies. The study also asked about clinical practice issues surrounding the prepubertal genital examination.

Results: An overall response rate of 73% was achieved and analysis was done on 139 respondents. One-half of chief residents thought that their training during residency on sexual abuse was inadequate for practice. Sixty-four percent of chief residents correctly labeled the hymen on the photograph used in the previous studies, which was not significantly different from the 62% and 59% of physicians who correctly labeled the hymen in the previous surveys. In the second photograph, which more clearly displayed the various anatomic structures, 71% correctly labeled the hymen.

Conclusion: Pediatric chief residents reported variable amounts of training on issues pertaining to child sexual abuse during residency, think that this time was inadequate, and, while doing slightly better than a more diverse group of physicians, were still not fully trained in the issues surrounding the routine genital examination.
previously studied physicians, did not achieve 100% accuracy in identifying basic genital structures correctly on two different photographs.

Keywords: Child sexual abuse; Genital anatomy; Prepubertal genital examination; Residency training

Introduction

Physicians play a pivotal role in the medical evaluation of child sexual abuse (Finkel & DeJong, 1994; Hibbard, 1998; Jenny, 1996; Ludwig, 2000). The physician’s responsibilities include the medical history, physical examination, collection of laboratory specimens, interpretation of all findings, and the construction of a treatment plan (Jenny, 1996; Rosenberg & Gary, 1988; Schmitt, 1978; Sgroi, 1982). The physician’s role requires skill in the physical examination and interpretation of findings (Hibbard, 1998; Paradise, 1990). In addition to technical skills, the physician should also have the ability to collaborate on an interdisciplinary team that works together to complete the evaluation and investigation of the child suspected of having been sexually abused (Ells, 1998).

Professional literature, over the past two decades, has examined many aspects of the physical examination in the context of sexual abuse, including: normal versus abnormal prepubertal genital and anal findings, classification systems for genital findings in the context of sexual abuse allegations, physician recognition and interpretation of genital findings, and the ability of physicians to label and identify anatomic structures of the prepubertal genitalia (Adams, 2001; Adams, Harper, Knudson, & Revilla, 1994; Herman-Giddens & Frothingham, 1987; Kellogg, Parra, & Menard, 1998; Ladson, Johnson, & Doty, 1987; Lentisch & Johnson, 2000; Muram, 1989a, 1989b).

A 1997 survey examined physician agreement about female genital examination findings comparing physicians of varying experience levels who rated themselves as skilled at evaluating children suspected of sexual abuse with an expert physician panel (Paradise et al., 1997). Findings demonstrated that assessments often differed, with the most experienced physicians resembling an expert panel most closely (Paradise et al., 1997). A related study looked at whether clinical histories influenced physicians’ interpretations of female genital findings (Paradise, Winter, Finkel, Berenson, & Beiser, 1999). Diagnostic expectation resulting from the type of history provided appeared likely to influence the physicians’ interpretations of genital findings as being related to abuse or not (Paradise et al., 1999). Kellogg et al. (1998) studied patient records from children referred to a sexual abuse clinic because of anogenital signs or symptoms and found that only 15% had examination findings that were suggestive, probable, or definitive for sexual abuse. The majority of children had non-specific examination findings and children without a disclosure or suspicion of sexual abuse were unlikely to have anogenital examination findings suggestive of abuse (Kellogg et al., 1998). The authors attributed the majority of physician referrals for what appeared to be normal anatomic variants to a lack of widespread knowledge and familiarity with normal genital anatomy. The study suggested that physicians evaluating children for anogenital symptoms and signs should generate differential diagnoses that consider alternative conditions and causes not directly related to sexual abuse; of course, this requires physician familiarity with normal and abnormal genital anatomy (Kellogg et al., 1998).
Two previous studies using surveys of family practitioners, pediatricians and surgeons demonstrated that physicians have difficulty in correctly labeling and identifying basic genital structures on a photograph of a prepubertal child’s genitalia (Ladson et al., 1987; Lentsch & Johnson, 2000). An inability to identify basic anatomy on a photograph calls into question the ability of physicians to identify and interpret findings related to sexual abuse or to other non-abusive causes accurately. While the outcome of the child sexual abuse evaluation depends primarily on a child’s disclosed, detailed history, the physical examination is important and needs to be completed competently (Atabaki & Paradise, 1999; Botash, 2000). At its most basic level, a competent physical examination begins with the ability of the examiner to identify anatomic structures correctly (Bates, 1995; Seidl, Ball, Dains, & Benedict, 1999).

The authors conducted a national survey of pediatric chief residents to determine how accurately a group of recently trained physicians could identify and label prepubertal genital structures on two different photographs shown in Figures 1 and 2. Pediatric chief residents were selected because they represent a highly skilled group of physicians who after completing 3 years of training are invited to an additional year in their program serving in a leadership role with significant teaching responsibilities directed at more junior residents and medical students. We also sought to compare the responses from this survey to the responses of the practitioners from the two previous studies, which used the photograph shown in Figure 1 in their mailed questionnaire. We hypothesized that recently trained pediatricians would have better knowledge than the more diversely trained physicians surveyed in the previous studies and therefore would be better able to label basic anatomic structures on a photograph depicting a female
child’s prepubertal genitalia. Additionally, the authors sought to evaluate resident training and clinical practices surrounding sexual abuse and genitalia examination.

Methods

The study utilized a 38-item questionnaire modeled after original material from Ladson et al. (1987) to investigate and evaluate resident training and clinical practices related to sexual abuse and the prepubertal genital examination. The survey included two black and white photographs: Figure 1 (genitalia of a 6-year-old girl) and Figure 2 (genitalia of an approximately 3-year-old girl) with questions about anatomical names for labeled structures. The photograph in Figure 1 had been included in both the 1986 survey by Ladson et al. (1987) and a comparison 1996 survey by Lentsch and Johnson (2000). The second photograph was added in this study to improve the clarity of each labeled anatomic structure. To assure clarity and understanding, five pediatricians piloted the questionnaire prior to its use in the study. Additionally, the institutional review board at the Children’s Hospital of Philadelphia reviewed the study design. In addition to labeling the photographs, physicians were asked about their: (a) demography, (b) practice procedures in treating prepubertal patients, (c) recognition of the association between sexually transmitted disease and sexual abuse in prepubertal patients, and (d) knowledge of risk factors associated with sexual abuse.

During the 1998–1999 academic year, the questionnaire was sent to a chief resident at each of the pediatric programs within the continental United States listed in the 1997–1998 Graduate Medical Education Directory. A reminder letter was sent approximately 4 weeks later. Approximately 6 weeks later, phone
calls were made to non-respondents. A repeat questionnaire was sent during the 1999–2000 academic year to a chief resident at the pediatric programs that had not responded during the 1998–1999 academic year, and the same follow-up to non-respondents was done.

Results of the survey were compared to results from surveys done in 1986 by Ladson et al. (1987) and in 1996 by Lentsch and Johnson (2000). All statistical analyses used a contingency table analysis based on the $\chi^2$-square statistic unless otherwise specified.

Results

Of the initial 195 programs surveyed, responses were received from 142 of which 3 responded that they no longer had a program for an overall response rate of 73% (142/195). Analysis was done on the 139 responses, which resulted in a 72% response rate (139/192).

Demographics and experience with maltreatment training

The demographics of the responding chief residents and their programs are listed in Table 1. Fifty percent of respondents ($N=137$) did not consider their training during residency in the medical evaluation of sexual abuse to have been sufficient for their clinical practice. The median amount of time spent during their residency training in the medical evaluation of sexual abuse was 17 hours. This included a median of 5 hours (range: 0–100) ($N=126$) during the first year, 5 hours (range: 0–160) ($N=127$) during the second year, and 4 hours (range: 0–160) ($N=117$) during the third year of residency. Four programs reported 160 hours or a 1-month long child abuse rotation (40 hours per week for 4 weeks). Of the training described, about 50% was didactic in each year.

The experience of chief residents varied considerably with regard to the child sexual abuse evaluation. Of respondents ($N=138$), 9% of respondents had never performed a child sexual abuse evaluation while in residency training, 58% performed 1–10, 23% performed 11–20, and 9% performed greater than 20. Of respondents ($N=139$), 7% had testified in court concerning a sexual abuse case with an additional 13% having been subpoenaed but never called to court.
Table 2
Responses to questions regarding physicians’ clinical practice

<table>
<thead>
<tr>
<th>Question</th>
<th>Always (100% of the time)</th>
<th>Most of the time (&gt;90%)</th>
<th>Usually (70–90%)</th>
<th>Sometimes (50–69%)</th>
<th>Less than half of the time (1–49%)</th>
<th>Never (0%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>How often do you routinely examine the genitalia of a prepubescent female child? (N=139) (%)</td>
<td>12</td>
<td>38</td>
<td>31</td>
<td>9</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>How often do you assess the size of the hymenal opening of a prepubescent female child? (N=139) (%)</td>
<td>1</td>
<td>7</td>
<td>12</td>
<td>21</td>
<td>47</td>
<td>12</td>
</tr>
<tr>
<td>How often do you assess the shape of the hymenal opening of a prepubescent female child? (N=139) (%)</td>
<td>2</td>
<td>9</td>
<td>15</td>
<td>19</td>
<td>44</td>
<td>11</td>
</tr>
<tr>
<td>How often do you routinely examine the genitalia of a prepubescent male child? (N=39) (%)</td>
<td>22</td>
<td>42</td>
<td>23</td>
<td>9</td>
<td>4</td>
<td>0</td>
</tr>
</tbody>
</table>

**Physicians’ clinical practices**

Respondents were asked a series of questions related to how often they included different aspects of the genital examinations in an office visit for a prepubertal child and were given a 6-point scale upon which to respond (Table 2).

The survey asked a series of questions about behaviors and their association with sexual abuse. Table 3 lists items that might be indicative of child sexual abuse, and the table compares responses from this survey with the responses from Lentsch and Johnson (2000) and from Ladson et al. (1987). Findings indicate that pediatric chief residents in this study were significantly more likely to consider promiscuity as indicative of possible sexual abuse than the respondents of the Lentsch and Johnson (2000) study. Chief residents were significantly more likely to consider decreasing school performance, extreme hostility, and promiscuity as indicative of possible sexual abuse than the respondents of the Ladson et al. (1987) study.

**Physician knowledge**

Physicians were asked to identify anatomic structures seen in Figure 1 by matching them with a list of potential structures. Table 4 indicates the parts labeled for identification of prepubertal female genital anatomy in Figure 1 and the proportion of physicians who correctly identified them. When comparing the responses from the previous surveys there were significant differences with regard to the posterior commissure, the labia minora, and the labia majora. For the posterior commissure and the labia majora,
Table 3
Percentage of respondents who feel that the following behaviors may be indicative of sexual abuse

<table>
<thead>
<tr>
<th>Behavior</th>
<th>Chief residents (%)</th>
<th>Lentsch and Johnson (2000) (%)</th>
<th>Ladson et al. (1987) (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sexually transmitted disease</td>
<td>97</td>
<td>96</td>
<td>83†</td>
</tr>
<tr>
<td>Simulation of sex acts in children younger than 7 years old</td>
<td>95†</td>
<td>92</td>
<td>NA</td>
</tr>
<tr>
<td>Promiscuity</td>
<td>96</td>
<td>91†</td>
<td>72†</td>
</tr>
<tr>
<td>Seductive behavior in child younger than 7 years old</td>
<td>97</td>
<td>90†</td>
<td>NA</td>
</tr>
<tr>
<td>Age inappropriate knowledge of sex</td>
<td>92</td>
<td>89</td>
<td>NA</td>
</tr>
<tr>
<td>Running away from home</td>
<td>88</td>
<td>89</td>
<td>90</td>
</tr>
<tr>
<td>Decreasing school performance</td>
<td>91</td>
<td>89</td>
<td>83†</td>
</tr>
<tr>
<td>Pregnancy*</td>
<td>93</td>
<td>88</td>
<td>92</td>
</tr>
<tr>
<td>Extreme hostility</td>
<td>83</td>
<td>86</td>
<td>75†</td>
</tr>
<tr>
<td>Poor self-esteem</td>
<td>76</td>
<td>83</td>
<td>82</td>
</tr>
<tr>
<td>Phobias</td>
<td>75</td>
<td>71</td>
<td>74</td>
</tr>
<tr>
<td>Sex play with age mate</td>
<td>52</td>
<td>45</td>
<td>57</td>
</tr>
<tr>
<td>Masturbation</td>
<td>29</td>
<td>33</td>
<td></td>
</tr>
<tr>
<td>In private</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>In public</td>
<td>79</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Excessive</td>
<td>81</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>History of sexual abuse without physical findings on physical examination</td>
<td>96</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

* In the current survey this question was asked as pregnancy in a 13-year-old. In the previous surveys this question was asked as pregnancy.
† Not asked on these surveys.
* p < .05 when this survey is compared to Ladson et al. (1987).
† p < .05 when this survey is compared to Lentsch and Johnson (2000).
Table 4
Percentage of respondents identifying the anatomic structure correctly

<table>
<thead>
<tr>
<th>Structure</th>
<th>Chief residents original picture (%)</th>
<th>Lentsch and Johnson (2000) (%)</th>
<th>Ladson et al. (1987) (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clitoris</td>
<td>94</td>
<td>94</td>
<td>89</td>
</tr>
<tr>
<td>Posterior commissure</td>
<td>87†</td>
<td>87</td>
<td>81†</td>
</tr>
<tr>
<td>Urethra</td>
<td>63</td>
<td>72</td>
<td>78</td>
</tr>
<tr>
<td>Labia minora</td>
<td>90†</td>
<td>83†</td>
<td>76†</td>
</tr>
<tr>
<td>Labia majora</td>
<td>80†</td>
<td>79</td>
<td>62†</td>
</tr>
<tr>
<td>Hyphen</td>
<td>64</td>
<td>62</td>
<td>59</td>
</tr>
</tbody>
</table>

In the current survey a 3-year-old was specified. In the Lentsch and Johnson (2000) survey, no age was provided.
* Not asked.
there was a significantly higher percentage of correct responses in the 1996 study and this study than in the 1986 study ($p < .05$). For the labia minora, there were a significantly higher percentage of correct responses in this study than either the 1996 study or the 1986 study ($p < .01$).

In addition to identifying anatomic structures in Figure 1, the respondents of this study were asked to identify structures in Figure 2. The same structures were labeled in Figure 2, and the same list of potential structures was provided. Using a McNemar test, pediatric chief resident respondents were more likely to correctly identify the urethra and labia majora in Figure 2 than in Figure 1 ($p < .05$).

**Discussion**

The results of this study indicate that recently trained pediatric residency graduates in their pediatric chief residency: (1) have difficulty identifying basic anatomic structures on photographs of prepubertal female genitalia, (2) do not uniformly examine the prepubertal genitalia of female patients, and (3) do not consistently recognize the likely sexual transmission of various pathogens in prepubertal females and the need for reporting of such infections to child protective services despite clear American Academy of Pediatrics (AAP) (1999) guidelines on this subject matter.

The 73% response rate of this study compares favorably to the Lentsch and Johnson (2000), and Ladson et al. (1987) studies with response rates of 45% and 43%, respectively. Compared to the previous surveys, the responding physicians to this survey were a homogenous group of recently trained pediatricians who were chosen to be chief residents at their institutions. The Lentsch and Johnson (2000) study was performed on practicing physicians including pediatricians (generalists and specialists), family practitioners, and emergency physicians, while the Ladson et al. (1987) questionnaire was mailed to family practitioners, pediatric residents, and fellows. Given that those surveyed in the current study were pediatric chief residents, drawn from a national sample, their responses were also able to provide insights into the current sexual abuse training within pediatric residency programs.

Compared to physicians in the previous surveys, pediatric chief residents are more diligent about checking the genitalia of prepubescent females as compared to the heterogeneous physician samples of the two previous studies. Ninety percent of chief residents examined the genitalia of prepubescent female children on at least half of office visits as compared to the 72% of the Lentsch and Johnson (2000) and 77% of the Ladson et al. (1987) study respondents.

The centerpiece of this survey was the labeling of the basic anatomic structures on photographs of female prepubertal genitalia. The responses of physicians in this survey show that deficiencies in recognizing normal female prepubertal genital anatomy continue among physicians. The chief residents were better able to identify a number of structures compared to the 1986 Ladson et al. (1987) survey and were generally on par with the 1996 Lentsch and Johnson (2000) survey with the exception of the labia minora, which they were able to identify better than those physicians surveyed in the past. Regardless of this improvement, clinical practice demands that a physician’s identification of anatomic structures should approach 100% for these basic structures.

This survey asked respondents to identify structures on a second picture that was subjectively an “easier” picture for identification of basic anatomic structures, secondary to picture clarity, than the original picture. The pediatric chief residents were more likely to identify correctly the urethra and labia majora on this second photograph. Lack of comparison photographs in the previous studies does not allow us to identify whether the differences in responses between Figures 1 and 2 were due to a significant
difference in the quality of the photographs or to improved physician knowledge since the prior studies. However, it is important to note that the identification of normal anatomy still fell below 100%.

A shortfall in the physician’s ability to label prepubertal anatomy and in knowledge about sexual abuse is not new, however. In addition to the two previous surveys by Ladson et al. (1987) and Lentsch and Johnson (2000), Socolar (1996) described physician knowledge about sexual abuse and factors that affected this knowledge in a statewide sample of physicians in North Carolina. She found several areas of inadequacy including Tanner staging and documentation of physical examination findings.

A limitation of our study is found in the photographic representation of the prepubertal female genitalia. A physician in the clinical setting has the benefit of the actual patient’s presence, as well as the child’s history to guide the examination. Additionally, the interpretation of such figures may vary substantially as influenced by specialization and experience (Paradise et al., 1997). It should be noted though that not only is a child not moving in a photograph but the genital structures are also magnified in a photograph taken using a colposcope. Additionally, survey responses may not be a true indicator of what a practicing physician does in the actual clinical setting.

The medical evaluation remains an important component of the overall investigation of suspected sexual abuse. Given that there were approximately 90,000 substantiated cases of child sexual abuse in 2001, pediatricians need to be aware of the issues surrounding child sexual abuse and be competent in doing, at a minimum, a preliminary assessment of the child’s signs and symptoms (USDHHS, 2003). Residency programs need to improve training efforts in this area and based on this survey’s results, as well as the previous research discussed, a focus needs to be placed on providing effective educational interventions that facilitate improved performance on the genital examination. In addition, practicing pediatricians may benefit from directed continuing medical education programs that fully address this serious issue. Based on their ability to label genital structures on a photograph it is clear that graduating pediatricians have not been uniformly taught all the basic information regarding female genitalia and genital findings.

Acknowledgments

The authors would like to thank Frances B. Pinnel, MS for invaluable library assistance, Rudy Lauletta for help with photographic reproductions, and Jeannie Hernandez for assistance with manuscript preparation.

References


entre esta etude y les respuestas a dos precedentes enquêtes, qui demandaient a un groupe plus hétérogène de médecins d’étiqueter une des photos utilisées dans cette étude. La deuxième photo avait été ajoutée pour sa meilleure mise en évidence de chaque structure anatomique par rapport à la première, utilisée dans les études antérieures. L’étude posait également des questions sur des points pratiques cliniques entourant l’examen génital prépubertaire.

**Résultats:** Un taux de réponse global de 73% a été obtenu et une analyse a été réalisée sur 139 réponses. La moitié des internes pensait que pendant leur internat, leur formation sur la maltraitance sexuelle était inadaptée à la pratique. Soixante-quatre pour cent des internes identifiaient correctement l’hymen sur la photo utilisée dans les études précédentes, ce qui n’était pas significativement différent des 62 et 59% des médecins qui avaient correctement identifié l’hymen dans les enquêtes précédentes. Sur la deuxième photo qui montrait plus clairement les différentes structures anatomiques, 71% identifiaient correctement l’hymen.

**Conclusions:** Les internes en pédiation ont décrit des quantités variables de formation aux questions se rapportant à la maltraitance sexuelle au cours de leur internat, ils pensent que cette période de formation est inadaptée, et alors qu’ils font un peu mieux qu’un groupe plus hétérogène de médecins précédemment étudiés, ils n’ont pas réalisé une précision de 100% dans l’identification correcte sur deux photos différentes des structures génitales de base.

**Resumen**

**Objetivo:** Evaluar cómo un grupo de recientemente formados jefes de residentes de pediatría pueden catalogar estructuras anatómicas de dos fotografías diferentes de genitales femeninos prepuberales. Además, el estudio debe explorar aspectos de la formación pediátrica en abuso sexual y de cuestiones de la práctica clínica relacionadas con la rutina de los exámenes genitales.

**Método:** Se envió por correo un cuestionario de 34 ítems a todos los jefes de residentes de pediatría de los programas oficialmente reconocidos de formación de pediatras en USA continental. Se hicieron las comparaciones pertinentes entre este estudio y las respuestas a dos previas encuestas en las que se preguntaba a un grupo más heterogéneo de médicos sobre la categorización de una de las fotografías utilizadas en este estudio. La segunda fotografía fue añadida por la mayor claridad de las estructuras anatómicas en comparación con la primera fotografía.

**Resultados:** Se alcanzó una tasa de respuesta del 73% de las cartas remitidas y se analizaron las respuestas de 139 sujetos. La mitad de los jefes de residentes pensó que la formación recibida durante la residencia en relación con el abuso sexual fue inadecuada para la práctica profesional. Un 64% de los jefes de residentes catalogó correctamente el himen en la fotografía utilizada en el estudio previo lo que no supuso una diferencia significativa con la tasa de respuestas correctas obtenidas en los estudios previos (62% y 59%). En la segunda fotografía, que presentaba más claramente varias estructuras anatómicas) un 71% catalogaron correctamente el himen.

**Conclusions:** Los jefes de residentes de pediatría notificaron cantidades variables de formación durante la residencia en cuestiones relacionadas con el abuso sexual y consideraron que este tiempo es inadecuado. A pesar de que rinden mejor que un grupo de médicos previamente estudiados, no alcanzan el 100% de precisión en la identificación correcta de estructuras genitales básicas en dos fotografías.