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Which sexual abuse victims receive a forensic medical examination? The impact of Children's Advocacy Centers[☆]

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Abstract

Objective: This study examines the impact of Children's Advocacy Centers (CAC) and other factors, such as the child's age, alleged penetration, and injury on the use of forensic medical examinations as part of the response to reported child sexual abuse.

Methods: This analysis is part of a quasi-experimental study, the Multi-Site Evaluation of Children's Advocacy Centers, which evaluated four CACs relative to within-state non-CAC comparison communities. Case abstractors collected data on forensic medical exams in 1,220 child sexual abuse cases through review of case records.

Results: Suspected sexual abuse victims at CACs were two times more likely to have forensic medical examinations than those seen at comparison communities, controlling for other variables. Girls, children with reported penetration, victims who were physically injured while being abused, White victims, and younger children were more likely to have exams, controlling for other variables. Non-penetration cases at CACs were four times more likely to receive exams as compared to those in comparison communities. About half of exams were conducted the same day as the

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reported abuse in both CAC and comparison communities. The majority of caregivers were very satisfied with the medical professional. Receipt of a medical exam was not associated with offenders being charged.

Conclusions: Results of this study suggest that CACs are an effective tool for furthering access to forensic medical examinations for child sexual abuse victims.

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Introduction

Forensic medical examinations are an important part of a comprehensive response to the investigation of suspected child sexual abuse, both to insure appropriate care for the child and to support legal decision-making. Many professionals recommend that all reported child sexual abuse victims have a medical evaluation (Adams et al., 2007; De Jong & Rose, 1989; Finkel & De Jong, 2001; Heger, 1996; Kerns, Terman, & Larson, 1994). Practice regarding forensic medical examinations for sexual abuse allegations seems to be changing dramatically. Heger and colleagues report that "an international revolution in the process and protocols for evaluating sexually abused children" is taking place, including the increased involvement of medical professionals in these cases (Heger, Ticson, Velasquez, & Bernier, 2002, p. 654). They note that many children now have access to Children's Advocacy Centers with medical experts.

Children's Advocacy Centers (CACs) are multidisciplinary organizations that investigate child abuse. An increase in the use of forensic medical examinations (exams) effected by CACs seems plausible, because access to exams is an integral standard in CACs, and the number of CACs has grown tremendously. Membership in the national CAC organization, the National Children's Alliance, has grown from 22 in 1992 to over 650 accredited or associate centers in 2007 (National Children's Alliance, 2007). This study thus serves both to evaluate the implementation of an important CAC standard and to assess the use of forensic medical exams for reported child sexual abuse victims more generally.

Forensic medical examinations

There are three purposes of exams. They can help identify medical evidence to prosecute the offenders (Britton, 1998; Kerns et al., 1994), screen for injuries and medical conditions and initiate medical treatment, and reassure victims and parents about the child's physical well being (Britton, 1998; Hanson et al., 2001; Heger & Emans, 1992; Kerns et al., 1994). Even in the absence of medical evidence, exams can support prosecution because it preempts defense claims that evidence collection is insufficient without an exam (see American Prosecutors Research Institute, 2004). Also, when the alleged perpetrator is guilty and medical evidence is lacking, the exam can engage a doctor or nurse in the case who can provide expert testimony to explain this lack of evidence to judges and juries.

A number of studies indicate that more experienced medical examiners and those with child sexual abuse assessment experience provide higher quality and more consistent decision-making than those with less experience, pediatricians or family practice residents (Adams & Wells, 1993; Brayden, Altemeier, Yeager, & Muram, 1991; Paradise et al., 1997; Paradise, Winter, Finkel, Berenson, & Beiser, 1999). Forensic examiners need to know how to conduct a specialized exam, including using a colposcope (which

provides magnification and photographic documentation); distinguish signs of child sexual abuse from normal anatomical variation or other conditions; preserve and report medical evidence; work with law enforcement and child protective services (CPS), and serve as an expert witness in court, if necessary. The use of telemedicine (a network of consultants to provide support and diagnostic capabilities via Internet-related technologies) in child abuse evaluations has helped in some areas (Kellogg, Lamb, & Lukefahr, 2000). A related development is the evolution of Sexual Assault Nurse Examiner (SANE) programs, nearly 100 nationwide, to train nurses to conduct exams of child sexual abuse victims (Ahrens et al., 2000; Canaff, 2004; Martell & Cross, 2003), but this effort does not yet fill the gap for qualified professionals.

Little information exists on the proportion of reported child sexual abuse cases that are referred for a forensic medical exam (Kerns et al., 1994). A small, non-experimental study found more than half of CAC cases received an exam compared to 13% of CPS cases (Smith, Witte, & Fricker-Elhai, 2006). In studies of individual communities, the percentage of children with reported abuse who receive exams ranges from 10% to 25% (Berliner & Conte, 1995; Faller & Henry, 2000; Hibbard, 1998; Whitcomb, Goodman, Runyan, & Hoak, 1994).

No general practice standards or national policy documents exist describing referral criteria for a forensic medical exam for child victims of reported sexual abuse (Fanflik, 2005; Kerns et al., 1994). In contrast, the Office on Violence Against Women developed a national protocol for sexual assault medical forensic examinations for victims 13 years of age and older (Office on Violence Against Women, 2004). Generally, experts recommend medical evaluation even in circumstances in which the need for physical treatment and medical evidence are both unlikely. This is because even the small possibility of either justifies the exam, along with the need to reassure victims of their bodily integrity and address their concerns (Adams et al., 2007; Holmes, 1995; Jenny, 2002).

Timing of the examination

Forensic medical examinations are usually recommended within 72 hours of the assault (Hibbard, 1998; Jenny, 2000) because passage of time and the healing process can obscure medical evidence if there is longer delay. When 72 hours have already transpired and in non-acute situations, a short delay may be advisable if it avoids the exam being conducted in “chaotic circumstances” and by non-specialized professionals (Hibbard, 1998; Palusci, Cox, Shatz, & Schultze, 2006). Timing depends on the availability of the examiner, time of day the child presents, presence of physical signs and symptoms that demand an immediate response, potential for the exam to enable a reluctant victim to disclose, and wishes and feelings of the child and family (Hibbard, 1998). The study by Heger and colleagues (2002) found that all exams were conducted within 7 days of the referral. These researchers also concluded that many of the few positive exams that showed evidence of acute assault would have healed quickly, and this evidence would have been lost, if the exams were delayed.

Children’s Advocacy Centers

Children’s Advocacy Centers are particularly relevant for the medical response to child abuse because these programs play a major role in coordinating all investigators (including medical), and thus could facilitate referrals for, and use of, medical evidence. The CAC philosophy is that the intervention system should respond to the individual needs of the child and family and that the most effective response builds upon the expertise of multiple agencies (Chandler, 2000). A multidisciplinary investigation team is one of

the defining and universal elements of CACs. CACs typically facilitate a number of services for victims in addition to medical evaluations, including psychotherapeutic intervention, victim advocacy, family support, case review, and case tracking (National Children's Alliance, 2000; Simone, Cross, Jones, & Walsh, 2005). Although CACs share the same philosophy and basic program components, the settings, populations, and program implementation vary tremendously (Walsh, Jones, & Cross, 2003). Some CACs are independent, nonprofit organizations, whereas others are located within children's hospitals, prosecuting attorney's offices, child protective service agencies, or larger nonprofit human service agencies.

One of the 10 core CAC standards states, "Specialized medical evaluation and treatment services are available to all CAC clients and coordinated with the multidisciplinary team response to provide follow-up referrals and/or treatment as necessary" (National Children's Alliance, 2000). A survey of 71 directors of CACs who were members of the organization that accredits CACs, the National Children's Alliance, indicated that 53% had on-site medical services, 34% referred families to hospitals, 12% referred to clinics, and 1% referred to both hospitals and clinics (Jackson, 2004). The vast majority of centers (90%) have physicians conduct the exams.

Current study

Despite its obvious importance in what is considered best medical care for child sexual abuse victims, few studies have examined the extent to which reported child sexual abuse victims receive exams and when they receive them (Hanson et al., 2001; Heger et al., 2002; Hibbard, 1998; Palusci et al., 2006). And only one small study compared exam receipt for CAC and CPS cases (Smith et al., 2006). Using data from four CACs and comparison communities without such centers, the current study examines whether CACs influence the use and timing of forensic medical exams. We also investigate more comprehensively which children receive exams. In addition, we examine other aspects of the exam, such as caregivers' satisfaction with the exam and the association between receipt of an exam and charging offenders. Understanding which children currently receive exams may help to develop and implement a more effective medical response to suspicion of child sexual abuse.

Method

This analysis is part of a quasi-experimental study, the Multi-Site Evaluation of Children's Advocacy Centers. At each site, data were collected on a sample of CAC cases and on a sample of child abuse cases from comparison communities without CACs in the same state. In several places CAC and comparison communities were adjacent so that the facilities used for medical exams were often the same. For more information on the Multi-Site Evaluation Project findings and additional details on the CAC and comparison sites see Cross, Jones, Walsh, Simone and Kolko (2007, this issue), Cross et al. (in press) and Jones, Cross, Walsh, and Simone (2007, this issue). The four CACs that were chosen to participate were among the most experienced and long-standing in the country. Participating sites included the following four CACs.

The Dallas Children's Advocacy Center (DCAC), in Dallas TX (opened 1991)

The Dallas Police Department played a central role in the development of DCAC, and a specialized child abuse unit is housed on-site along with a special unit of Dallas County Child Protective Services

(CPS). DCAC provides medical exams to clients through the REACH (Referral and Evaluation of Abused Children) Clinic at Children's Medical Center in Dallas. The clinic provides assessments, review of medical data, and legal testimony for child abuse victims by specially trained physicians and medical staff. This clinic has access to a colposcope, but any medical photographs are used for peer review only and are not used in court.

In order to attain a comparable sample size, two cities in Dallas county were selected as comparison communities: Garland and Irving, TX. Both often refer clients to the REACH Clinic about 5–20 miles away. Clients are also referred to the emergency department at two local hospitals.

The Dee Norton Lowcountry Children's Center, Inc. (LCC) in Charleston, SC (opened 1991)

LCC has organized close ties with a number of community agencies that work with children. LCC stations two medical practitioners on-site, a physician and pediatric nurse practitioner. LCC has a fully equipped medical exam room with a colposcope and video equipment available. The medical practitioners are staff of the Medical University of South Carolina, which houses a nationally renowned center for victims of violent crime and their families. Medical exams are provided to LCC clients when investigators suspect abuse based on the outcome of the forensic interview or if a parent or child requests the exam for information or reassurance.

Oconee and Anderson Counties in South Carolina served as the LCC comparison communities. Child protective services in Oconee would refer for exams when penetration was reported, either using a specialist 75 minutes away or the local hospital that lacked a specialist. In Anderson, when there was a report of penetration or injury child protective services would refer children to a specialist over an hour away or to the local emergency department with no specially trained professional.

The National Children's Advocacy Center (NCAC), Huntsville, AL (opened 1985)

NCAC was the nation's first CAC and still plays a leadership role in the field. Law enforcement, CPS, prosecution, mental health, medical, and educational agencies are all located at the NCAC. NCAC has on-site medical services provided by a nurse practitioner in consultation with a specially trained pediatrician. A referral for a medical exam is made if there is reason to suspect physical evidence, injury, infection, or pregnancy. There may also be an exam if a parent or child requests one for reassurance.

Morgan County, Alabama served as the comparison community. Morgan County refers clients to physicians within the community of Morgan County or to the specialty clinic at the NCAC in Madison County, about 45 minutes away.

The Pittsburgh Child Advocacy Center (PCAC), in Pittsburgh, PA (opened 1988)

PCAC, at Children's Hospital of Pittsburgh, had one of the earliest medical child abuse programs in the nation, dating back to the 1960s. The PCAC is located in a hospital setting and functions as a Department of Children's Hospital of Pittsburgh. Specialized medical examiners and mental health professionals are located on-site. The hospital setting provides a unique opportunity for medical staff at the hospital to use the CAC regularly when child abuse is suspected. PCAC staff provide consultative services for other units in the hospitals, particularly the emergency department, orthopedics (e.g., suspicious broken bones), and a special unit providing pediatric care to foster children.

Armstrong County, PA served as the comparison community for PCAC. In this community, decisions about referral for medical exams are made at the discretion of the law enforcement or CPS investigator; some refer children to a family physician, while others refer cases to the Pittsburgh CAC, a 40-mile drive from Armstrong, or to Percy Hospital.

Sample

Cases were enrolled between December 2001 and December 2003, with data collection continuing through December 2004. Site research teams generally included every available case initiated in the CAC and in the comparison community CPS agencies during the enrollment period. Police cases were included as well in the South Carolina and Dallas County comparison communities. When the number of CAC or comparison cases exceeded resources to abstract, a process simulating random selection was used (e.g., taking every third case). For more information on sample selection, participant protection, and data collection see Cross et al. (2007, this issue).

Case file data were collected on an overall sample of 1,452 cases across the four research sites (including CAC and comparison community data). Cases primarily involved allegations of sexual and physical abuse (84% and 18%, respectively). Cases could have allegations involving multiple types of abuse. The four CACs and their comparison community samples varied significantly in the percentage of their research sample that featured allegations of sexual versus physical abuse (e.g., Charleston's sample, CAC and comparison, was exclusively sexual abuse). Because referral for forensic medical examination differs in cases of sexual and physical abuse, only cases of reported sexual abuse were included in the present study ($N = 1,220$).

Variables

Data on medical exams abstracted from case records included information about whether an exam was conducted and the date of the exam. Forensic medical exam was defined as an exam conducted to identify medical evidence of abuse. Time from report to exam was calculated by the number of days from the date of first report of alleged abuse to an investigative agency to the date of the exam. Presence of the following variables was determined by researcher ratings based on the case record: (1) victim's sex, (2) victim's age at forensic interview, (3) whether the child was physically hurt/injured as part of the alleged abuse characteristics (yes [mild, moderate, and severe] or no), (4) whether the reported sexual abuse included penetration (vaginal or anal) as part of the alleged abuse characteristics, (5) whether the child disclosed abuse, (6) whether the non-offending caregiver was supportive at disclosure and/or forensic interview (yes or no). The supportiveness of the non-offending caregiver was determined by researcher ratings based on the case record.

A subset of caregivers ($N = 143$) was interviewed about their experiences with the investigation (see Jones et al., 2007, this issue, for more information). Caregivers were asked how satisfied they were with how the medical professional worked with their child and how satisfied they were with the overall job the medical professional did during the investigation (responses were very satisfied, somewhat satisfied, somewhat unsatisfied, very unsatisfied).

Lastly, since medical exams can support prosecution, the relationship of medical exams to filing criminal charges was examined. Whether criminal charges were filed was determined by case abstractors

conducting follow-up case record reviews of prosecution and court records approximately 2 years after the case was enrolled in the research study.

Data analysis

Comparisons between CAC and comparison communities, both within and across sites, were made using Pearson χ^2 tests, independent sample *t* tests, and Mann-Whitney *U* tests. In some cases, expected cell frequencies were too small for Pearson χ^2 and we used the Fisher Exact Test for two by two tables and the Fisher-Freeman-Halton Exact Test for larger tables (Mehta & Patel, 1986). Logistic regression was used to evaluate the role of multiple variables in explaining receipt of an exam, such as CAC versus comparison community, while controlling for other variables. To increase the number of cases in the regression and account for differences in cases with and without missing data, a series of orthogonal contrasts were created representing whether cases had valid or missing data for the child's race, alleged penetration, child's injury, and non-offending caregiver support, following the method described by Cohen and colleagues (Cohen, Cohen, West, & Aiken, 2003). Diagnostic evaluations of the data indicated no problems with multicollinearity. Interaction terms were also examined as part of the logistic regression model to examine which variables predicting exams were differentially important in CACs and comparison communities.

Results

Sample characteristics

Table 1 shows the characteristics of the sample in the four CACs and four comparison sites. The majority of victims were females. The child's average age at forensic interview was 9.3 for CAC cases and 10.3 for comparison cases, but this varied by site. Only the Huntsville CAC (NCAC) had older victims than their comparison site. As expected, racial and ethnic makeup of the samples varied across sites depending upon the demography of the outlying community. Some sample characteristics varied substantially, reflecting differences in the referral patterns among CACs and comparison communities (Walsh et al., 2003). Thus the percentage of cases at each site that included allegations of penetration ranged from 17% to 51%, and the percentage of children who were injured as a result of the abuse ranged from 5% to 42%. Disclosure of abuse by the children was common in the CAC and comparison community caseloads ranging from 77% to 100% of the samples (for more information on disclosure see Lippert, Cross, Jones, & Walsh, 2007). Caregivers were rated as providing a high level of support across all communities.

Was a forensic medical exam conducted?

Overall, 48% of children in the CAC sample had an exam versus 21% in the comparison sample ($p < .001$), but there was a range in the percentage of medical exams conducted across the four research sites (see Figure 1). The hospital-based CAC in Pittsburgh had the largest percentage of exams, and a significantly larger percentage than its comparison community ($p < .001$). The CACs in Dallas and Charleston had a significantly larger percentage of exams than their respective comparison communities

Table 1
Sample characteristics of child sexual abuse cases

Characteristics	Dallas		Charleston		Huntsville		Pittsburgh		Overall	
	CAC <i>n</i> = 210	Comparison <i>n</i> = 187	CAC <i>n</i> = 252	Comparison <i>n</i> = 209	CAC <i>n</i> = 188	Comparison <i>n</i> = 74	CAC <i>n</i> = 85	Comparison <i>n</i> = 15	CAC <i>n</i> = 735	Comparison <i>n</i> = 485
Female (%)	86	86	72	83**	84	76	73	67	79	82
Child's age at forensic interview										
Mean	8.8	10.8	8.9	9.9	11.4	10.0	7.4	11.4	9.3	10.3
SD	3.5	4.1***	4.2	4.5*	4.3	4.6*	3.8	3.8***	4.2	4.4***
Child race (%)										
White	14	44	63	83	70	83	76	100	51	68
African-American	43	18	34	12	26	16	11	0	33	15
Latino	38	36	0	3	2	2	2	0	12	16
Other	4	2***	3	2***	3	0	11	0	4	2***
Alleged penetration (%)	44	51	25	17*	41	27*	46	23	37	32
Child sustained physical injury (%)	23	14	33	42	9	6	24	20	22	16
Child disclosure (%)	93	88	95	93	88	77*	84	100	91	87
Non-offending caregiver supportive (%)	87	79	91	94	88	93	97	87	90	85

Note: Missing data was <5% for race, child disclosure, and child physically hurt. Missing data ranged from 6% to 12% for penetration alleged and non-offending caregiver supportive except for the following. The Pittsburgh CAC had 38% missing data for race; the Dallas CAC and Comparison had 36% missing data for child physically hurt; the Charleston Comparison had more than 60% missing for child disclosure, physically hurt, and non-offending caregiver supportive.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

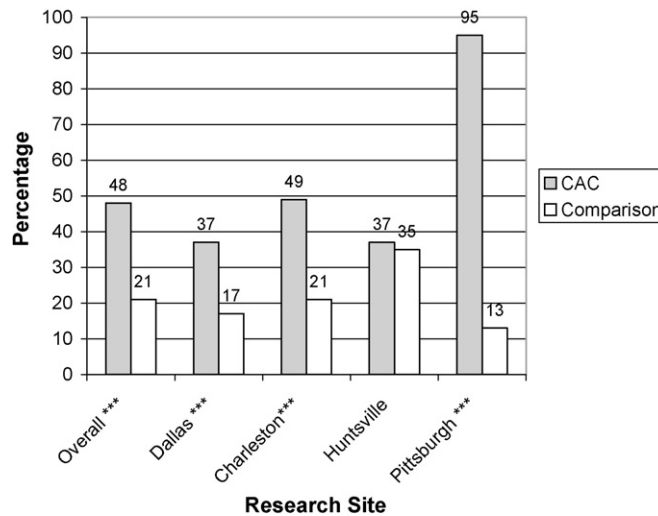


Figure 1. Percentage of CAC and comparison cases receiving a medical exam. *Note:* N for overall CAC = 735, overall comparison = 485, Dallas CAC = 210, Dallas comparison = 187, Charleston CAC = 252, Charleston comparison = 209, Huntsville CAC = 188, Huntsville comparison = 74, Pittsburgh CAC = 85, Pittsburgh comparison = 15. *** $p < .001$.

($p < .001$ and $p < .001$). There was no significant difference in whether an exam was conducted in the CAC in Huntsville and its comparison community.

When was the exam conducted?

As shown in Table 2, it was common for exams to be conducted the same day as the first report of the abuse in both the CAC communities (56%) and comparison communities (50%). Noteworthy proportions of cases had exams more than a week after the report of the abuse. Overall, there were no significant differences between CAC and comparison communities in timeliness of the medical exam. However, whether the CAC exam differed in timeliness from the comparison depended on the CAC; 59% of the Huntsville CAC exams were conducted the same day as the report compared to 32% of those at the comparison community ($p < .05$). For Charleston, comparison communities conducted their exams significantly more rapidly than the CAC, even though they conducted exams in a smaller proportion of cases. There were no significant differences in timeliness of exams for the Pittsburgh or Dallas CACs.

Who receives a forensic medical exam?

Pearson correlations indicated several variables that were associated with receiving an exam. When we pooled cases across the CAC and comparison samples, younger children ($r = -.26$, $p < .01$), those with suspected penetration ($r = .19$, $p < .01$), those who were physically hurt or injured while being abused ($r = .22$, $p < .01$), and those with non-offending caregivers who were rated as supportive ($r = .08$, $p < .05$) had a significantly larger percentage of exams. There was also a trend toward girls receiving a larger percentage of exams than boys ($r = .06$, $p = .051$).

Table 2
Time from report to exam

Characteristics	Dallas		Charleston		Huntsville		Pittsburgh		Overall	
	CAC <i>n</i> = 70	Comparison <i>n</i> = 26	CAC <i>n</i> = 107	Comparison <i>n</i> = 41	CAC <i>n</i> = 63	Comparison <i>n</i> = 22	CAC <i>n</i> = 81	Comparison <i>n</i> = 2	CAC <i>N</i> = 321	Comparison <i>N</i> = 91
Days from report to exam (%)										
Same day	63	42	37	61	59	32	74	100	56	50
1–3 days	9	15	18	10	10	14	5	0	11	12
4–7 days	7	8	10	2	3	0	3	0	6	3
8–31 days	14	31	16	17	19	46	14	0	16	28
>31 days	7	4	19	10*	10	9*	5	0	11	8

* $p < .05$.

Table 3
Logistic regression predicting medical exam ($N = 1,205$)

Predictor	Odds ratio	95% Confidence interval
Pittsburgh sites (CAC and comparison)	5.54***	2.84–10.81
Dallas sites (CAC and comparison)	.39***	.25–.61
Charleston sites (CAC and comparison)	1.21	.80–1.83
Female	2.04***	1.40–2.96
Child age	.84***	.81–.87
Child race: missing vs. valid	.89	.70–1.13
Child race: white vs. other	1.22*	1.04–1.44
Child physically injured: missing vs. valid	1.03	.91–1.17
Child physically injured: yes vs. no	1.41**	1.14–1.75
Penetration alleged: missing vs. valid	1.21	1.00–1.48
Penetration alleged: yes vs. no	1.75***	1.48–2.07
Caregiver supportive: missing vs. valid	1.36***	1.17–1.58
Caregiver supportive: yes vs. no	1.09	.85–1.40
CAC vs. comparison	2.19***	1.59–3.02

Note: Huntsville sites (CAC and comparison) serves as the reference group.

* $p < .05$

** $p < .01$.

*** $p < .001$.

Next, we conducted a logistic regression to examine the predictors of receiving an exam. Variables whose correlation with receiving an exam was statistically significant at $p < .05$ were included in the regression model. In addition, child's sex was included because it was marginally significantly associated with the likelihood of an exam. Child's race was included as well because CAC and non-CAC communities differed in this, and because research suggests that there are important differences by race on many child abuse intervention outcomes (Miller & Cross, 2006). To control for variation by research site, data from three research sites were compared to a fourth (Huntsville), which was chosen as a reference because scores from this site were in the middle of the distribution. Because nearly all cases at the Pittsburgh CAC received an exam, we conducted the analyses with and without this research site. Results were similar, so it was included in the model.

As shown in Table 3, more children at the Pittsburgh sites ($OR = 5.54$) and fewer children at the Dallas sites ($OR = .39$) received an exam compared to those at the Huntsville sites. A number of case characteristics significantly increased the likelihood of receiving an exam. More females ($OR = 2.04$), younger children ($OR = .84$), White children ($OR = 1.22$), children who were injured ($OR = 1.41$), and children with suspected penetration ($OR = 1.75$) received exams. More CAC cases received exams than comparison community cases ($OR = 2.19$).

Interaction terms for all variables and CAC versus comparison case were entered. The only significant interaction was the type of case (CAC or comparison) and whether penetration was suspected. Non-penetration cases at CACs were four times more likely to receive exams as compared to non-penetration cases in comparison communities, controlling for other variables. Children with suspected penetration at CACs were 1.5 times more likely to receive exams as compared to suspected penetration cases in comparison communities, controlling for other variables.

Effects of the medical exam

Lastly, we were interested in general questions about the effects of the exam, specifically, how satisfied the non-offending caregiver was with the exam, and how the exam related to prosecution. A subset of caregivers ($N = 143$) was interviewed about their experiences with the investigation (see Jones et al., 2007, this issue, for more information). The majority (78%) of caregivers were very satisfied with how the medical professional worked with their child, 18% were somewhat satisfied, and 3% were somewhat or very unsatisfied. Likewise, the majority (79%) of caregivers were very satisfied with the overall job of the medical professional, 16% were somewhat satisfied, and 5% were somewhat or very unsatisfied. There was no significant difference in satisfaction for CAC versus comparison community samples.

To explore whether cases in which a child received an exam had a higher proportion of offenders charged, only cases in which law enforcement was involved were included in this analysis ($N = 907$). Forty percent of cases with offenders charged had a medical exam as compared to 37% of cases with no offender charged ($p = ns$).

Discussion

We found that 48% of children at the CACs had a forensic medical exam compared to 21% of children at comparison communities. More females, younger children, White children, children who were injured, and children with suspected penetration received exams. Non-penetration cases at CACs were four times more likely to receive exams as compared to those in comparison communities. Although the field is still debating the optimal rate of medical involvement in sexual abuse cases, many medical professionals agree that increasing children's access to medical evaluations by trained personnel is important (De Jong & Rose, 1989; Finkel & De Jong, 2001; Heger, 1996; Kerns et al., 1994). Results of this study suggest that CACs are an effective tool for furthering this goal.

Reasons why some receive exams and others do not

In the past two decades there has been increased involvement of the medical community in multidisciplinary child abuse investigations and development of medical centers with specially trained personnel (Heger, 1996; Kerns et al., 1994). The inclusion of a process for providing children with access to medical evaluation is a core component of CACs. Their commitment to increasing this service likely explains the larger proportion of cases at CACs receiving exams. It is important to note, however, that there was a range in the proportion of cases receiving an exam, from 37% to 95% across CAC communities and from 13% to 35% across comparison communities. It is difficult to place these results in a national or historical perspective because of the paucity of previous research. However, a small non-experimental study found more than half of CAC cases received an exam compared to 13% of CPS cases (Smith et al., 2006).

In addition to differences by type of case (CAC vs. comparison), girls, younger children, White children, children who were injured, and children with suspected penetration received exams, controlling for other variables. Most notable, non-penetration cases at CACs were more likely to receive exams as compared to non-penetration cases in comparison communities. This finding suggests that CACs are perhaps more willing or able to offer services in cases where evidence of abuse is less likely.

There seems to be support in the medical field for expanding service beyond just those cases that are most likely to result in evidence. Medical professionals have noted that one of the most important reasons for having an exam is to reassure a child of his or her body integrity (Heger et al., 2002; Jenny, 2002; Muram, 1989). Given this goal, efforts to extend services to a wider range of suspected victims may be beneficial. However, considering that some children, especially those without a clear explanation about the exam or those with a previous negative medical experience, report a negative experience during exams (Allard-Dansereau, Hebert, Tremblay, & Bernard-Bonnin, 2001; Britton, 1998; Davies & Seymour, 2001; Lazebnik et al., 1994; Prior, 2001), more research is needed on optimal referral criteria.

Timing of exam

About half of exams were conducted the same day as the report of abuse. However, because we did not have information on when the abuse occurred in relation to the time of the report, conclusions about the timing of the exam are tenuous. If abuse occurred weeks before the report, children would not need an immediate examination. A recent study found children seen within 72 hours of alleged sexual contact had higher rates of positive physical findings compared to those seen non-urgently; however, findings were rare and the time of the assessment should depend upon the needs of the child, as well as other factors (Palusci et al., 2006).

Medical exam and the investigation

The vast majority of non-offending caregivers were very satisfied with how the medical professional worked with their child and with the overall job of the medical professional. This is encouraging given that the exam can affect the process by reassuring parents as well as victims about the child's physical well being (Britton, 1998; Hanson et al., 2001; Heger & Emans, 1992; Kerns et al., 1994). Cases that received exams were not more likely to have offenders charged or arrested. Few studies have examined receipt of exams and filing charges, and findings are mixed whether medical evidence is associated with filing charges (Brewer, Rowe, & Brewer, 1997; Cross, De Vos, & Whitcomb, 1994).

Limitations

The findings should be interpreted within the context in which the evaluation was conducted. First, agency records were used to obtain data, and it is possible some cases received exams that were not documented in the record. Also, we based research teams in the CACs because of their access to and skills in gathering information, but it is possible that this could have introduced some bias in data collection. Given the large effects we found consistently across research sites, however, it is not likely that differences we found between the CAC and comparison communities are due to researcher bias. Second, we did not have information on the time of the child abuse report compared to the time of abuse which would be helpful in interpreting findings on when the exam occurred. Third, it is important to note that these findings represent only a limited sample of CACs and may not necessarily generalize to all CACs. There were some key CAC models and types, such as a district-attorney office-based program, which were not represented among the four CACs in the evaluation. Lastly, because of the need for adequate sample sizes, smaller CACs from suburban or rural communities were not included. Because we selected some of the best known and oldest CACs, this study examines the CAC models' efficacy, or impact under

optimal conditions, rather than an effectiveness study, or impact under more typical conditions (i.e., less established, fewer resources, implementation problems). In addition, there are numerous models of collaboration in communities without CACs, and there was a range in collaboration among the comparison communities in this study. It would be informative for further research to explore different models of coordinating child abuse investigations and providing quality medical assessments.

Implications

More information is needed about how community structures, resources, and philosophical belief systems of professionals enhance or deter receipt of exams. Some communities have multidisciplinary teams and child abuse diagnostic centers that may be quite effective given geographic areas and limited resources. CACs are one model of service delivery. They are, however, currently the only multidisciplinary investigation model that has a national membership board and a formal accreditation process. CACs should participate actively in the inquiry about developing national benchmarks or standards about referral criteria for forensic medical exams.

In summary, results of this study indicate that children at CACs have higher rates of forensic medical exams and there are child characteristics that enhance the likelihood of an exam. Females, younger children, White children, children who were injured, and children with suspected penetration were more likely to have an exam. Together with CACs, medical and other professionals and the public as a whole should engage in much greater discussion of the appropriate medical response to child abuse.

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