Assessment of Suspicion of Abuse in the Primary Care Setting

Emalee Gottbrath Flaherty, MD; Robert Sege, MD, PhD; Christine L. Mattson, BS; Helen J. Binns, MD, MPH, for the Pediatric Practice Research Group

Objectives.—To describe the primary care practitioner's assessment of the likelihood that an injury was caused by physical abuse. The hypotheses were 1) practitioners face great uncertainty as to the possibility that an injury may have been caused by abuse; a measure that assigns variable degrees of suspicion to childhood injuries can be developed that will reveal this uncertainty; and 2) practitioner factors and patient factors influence this suspicion.

Methods.—Primary care practitioners in a regional practice-based research network prospectively collected information about each consecutive office encounter during a 4-week study period. For injury-related visits, the practitioner described injury type, reported cause and severity, and the practitioner's assessment of the cause of injury. Practitioners also used a 5-point Suspicion Scale to identify their level of suspicion that the injury was caused by abuse, with 1 equating to impossible and 5 equating to virtually certain. A subset of practitioners gave information about child and family risk factors. The practitioner's reporting activity was not studied.

Results.—Participating practitioners (n = 85) in 17 practices collected information about 12 510 office encounters, including 659 injuries. Although the practitioners assessed no injuries as ''caused by abuse,'' they rated 21% of the injuries as having ''some suspicion'' of abuse. Practitioners were more likely to have ''some suspicion'' of abuse for those children who were Hispanic or African-American (vs White) ($P = .001$, χ^2) and for those children whose mothers had no college education ($P = .018$, χ^2). In multivariate logistic regression modeling, ''some suspicion'' of abuse was associated with higher injury severity (odds ratio [OR] 3.4, 95% confidence interval [CI] 1.7, 7.0), age <6 years (OR 2.9, 95% CI 1.5, 5.6), Medicaid or self-pay health care (OR 1.4, 95% CI 1.4, 5.3), practitioner identification of family risk factors (OR 4.8, 95% CI 1.6, 14.6), and more recent practitioner education about child abuse (OR 2.9, 95% CI 1.4, 5.8).

Conclusion.—Primary care practitioners reported some degree of suspicion that 21% of injuries they evaluated were caused by abuse. Patient factors and practitioner factors influenced their suspicion.

KEY WORDS: child abuse; childhood injuries; child maltreatment

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Professionals who are mandated to report suspected child maltreatment make the majority of reports to state child protection service agencies (CPS), but among these professionals, office-based physicians are infrequent reporters.[1–3] We have little information about how frequently office-based physicians identify child abuse as the cause of injuries they see and about how they make the decision that a particular injury is caused by abuse.

Some childhood injuries, because of their appearance or other attributes, are easily recognized as being caused by abuse. The cause of other injuries may not be easily determined. The caretaker may invent a plausible history to explain the injury or the child may be preverbal. In addition, almost any injury can be caused by child abuse, including injuries that commonly have unintentional etiologies.

Jenny et al[4] found that physicians sometimes fail to identify abuse in patients, missing even 30% of the inflicted head trauma in 173 infants who were subsequently admitted to Colorado Children's Hospital with severe injuries. Many of these children had been reinjured after the initial visit. Other studies have documented that children with inflicted injuries frequently have evidence of prior abuse, some of which may have been diagnosable, yet such diagnoses were missed.[5–7]

Some health care practitioners are reluctant to make a report to CPS before they are certain of the diagnosis. Indeed, diagnostic uncertainty is one of the most common reasons primary care practitioners give for not reporting injuries suspicious of child abuse to CPS.[1,8,9]

The process of reaching a decision about the cause of an injury is complex. Warner and Hansen[10] propose that the process of identifying and reporting child abuse involves 4 stages: 1) assessment and evaluation, 2) identification, 3) reporting, and 4) validation. They suggest that when an injured child presents, a chain of responses ensues, with the response at each stage related to the response at the previous stage. Many factors can influence this process at each stage.

Previous studies have examined health care practitioner decision making about possible child abuse by evaluating their responses to vignettes and by collecting retrospective information about their child abuse reporting experience.[1,9,11,12] Reviews of the literature indicate that this

From Children's Memorial Hospital, Northwestern University Medical School, Chicago, Ill (Dr Flaherty, Ms Mattson, and Dr Binns); and the New England Medical Center, Boston, Mass (Dr Sege).

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Address correspondence to Emalee Gottbrath Flaherty, MD, Children's Memorial Hospital, Box 16, 2300 Children's Plaza, Chicago, IL 60614 (e-mail: e-flaherty@northwestern.edu).

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study describes the first prospective study of how frequently primary care practitioners suspect that an injury they evaluated was caused by child abuse. It describes practitioners' subjective level of suspicion and examines both patient and practitioner factors that may influence this suspicion.

METHODS

This prospective cross-sectional study tested 2 hypotheses: 1) practitioners face great uncertainty regarding the possibility that an injury may have been caused by abuse. A measure that assigns variable degrees of suspicion to childhood injuries can be developed that will reveal this uncertainty. 2) practitioner factors and patient factors influence this suspicion. This study was designed as a pilot study to evaluate data collection approaches for the study of child abuse injuries in primary care practices.

In addition to a uniform set of data variables, practices were randomly assigned to collect information concerning family and patient risk factors for child abuse or information concerning secondary injury prevention. Data from all participating practices (n = 17) were used for the analysis of provider suspicion of abuse and the provider and patient factors that influence this suspicion. Data from the subset (n = 10 practices) that collected information on child abuse risk factors were used for analysis related to risk factors.

Subjects

This study included 2 study groups—the full sample (FS) and a subset of the sample (SS). The FS practices were the 85 primary health care providers in 17 practices and the patients seen by these providers over a 4-week period. The 10 SS practices collected detailed information on child abuse risk factors in addition to the information collected by the other providers. Practices were recruited to participate with a single mailing to the 43 pediatric practices in the Pediatric Practice Research Group, a regional practice-based research network.[13]

Study Procedure

As a first step, all health care practitioners (physicians, nurse practitioners, and physician assistants) at each practice completed mailed questionnaires about their past experience with child abuse. Next, over a 4-week interval in the summer or fall of 1998, each practice collected demographic information on every office visit. If the patient was seen for an evaluation of an injury or if the practitioner observed an injury that he believed required a notation in the chart, the practitioner recorded information about the injury.

The practitioners were assured that study data were confidential, because information collected under an Agency for Health Care Research and Quality Grant is protected by 42 U.S.C., § 299a–1(c) of the Public Health Services Act. This statute does not allow the disclosure of information collected for reasons other than the purpose for which it was supplied. This assurance was important because state child abuse reporting laws provide for disciplinary action and legal consequences if a health care provider willfully fails to report child abuse. The Children's Memorial Hospital Institutional Review Board approved this study.

Data Instruments

Parent Demographic Form

At the office visit, a parent or guardian completed 8 demographic questions. The questions covered date of visit; patient age, gender, race, and ethnicity; third-party health care coverage and whether a referral was needed for subspecialty care; mother's educational achievement; and whether the reason for visit was an injury.

Injury Survey Form

Practitioners used this form to relay information about the child's injury. Items on the form included type of injury; the parent's explanation for the injury; consumer product involved, if any; and body location of the injury. Practitioners also noted injury severity (5-point Likert scale: 1 = minor, 5 = serious) and the office management of the injury.

For the SS (n = 10), the form also asked the practitioner to note the following child and family risk factors for abuse: injury not compatible with history; injury not compatible with child's level of development; child has several injuries of different ages; child had a number of injuries in the past; parent had little social support; parent had a history of alcohol or drug abuse or a history of major psychiatric illness; parent/child bonding caused the provider concern; or parent delayed in seeking care for the injury.

Two key questions were used to assess the practitioner's degree of suspicion that physical abuse may have caused the injury. Because the study was intended to examine usual clinical practice, participants were not provided with a standard definition of child abuse. The first question forms the ''Suspicion Scale'' and the second question relates to cause.

1. Do you think this injury was caused by abuse? (This response was rated on a scale of 1 [impossible] to 5 [virtually certain].)

2. Was the injury a) intentionally inflicted by another person but not child abuse; b) accidental or unintentional; c) unknown if intentional or accidental; d) self-inflicted; or e) suspected child abuse?

The practitioners were not asked if they reported the injury to CPS.

Practitioner Questionnaire

This questionnaire included 3 sections: demographic characteristics of the practitioner and practice; the practitioner's career experience with child abuse; and the practitioner's previous years' experience identifying and reporting child maltreatment. Respondents were requested to state the number of abused children seen in the past year and whether or not they reported all children to CPS. Reasons for not reporting were ascertained.

Response Rate

In order to assess parent and provider response rates, where possible, a count of patients seen during study days was determined and compared with the number of surveys completed.

Data Analysis

Survey data were entered and analyzed using SPSS for Windows (SPSS Inc, Chicago, Ill) and SAS (SAS Inc, Cary, NC). Statistical significance was set at $P < .05$.

For the analysis of suspicion of abuse, we classified injuries into 3 categories: 1) No suspicion—practitioners indicated ''1'' (impossible) that injury caused by abuse on the Suspicion Scale (see question 1 above) and assessed the injury as accidental, self-inflicted, or intentionally inflicted by another person, but not as child abuse; 2) some suspicion—practitioners indicated ''2'' level of suspicion on the Suspicion Scale or responded that it was ''unknown whether the injury was intentional or accidental''; or 3) moderate suspicion—practitioners indicated ''3–5'' on the Suspicion Scale or indicated that they suspected that the injury was caused by child abuse. (One provider indicated that she was virtually certain [ie, ''5'' on Suspicion Scale] that one child had an injury caused by abuse, but she then indicated that this child's injury was inflicted by another child. We did not count this injury as ''definitely caused by child abuse'' in our analysis).

For some analyses of practitioner-related variables, practitioners were divided into 2 groups: practitioners who had identified any injuries as suspicious (''some suspicion'' or ''moderate suspicion'') and practitioners who identified all injuries as having ''no suspicion'' of abuse.

Data were examined to describe frequencies and distributions. Bivariate analyses were conducted using *t* test, chi-square test, Fisher's exact, or Mann-Whitney *U* tests, as appropriate. The Cochran-Armitage Trend (CAT) test was used to analyze trends.

Two multivariate logistic regression analyses were undertaken. The first used the FS data set to examine associations between child characteristics and site of care (independent variables) on the dependent variable—suspicion of abuse (none vs some). The second multivariate logistic regression used the SS data to examine the influence of child and practitioner characteristics, injury severity and risk factor identification (independent variables) on the dependent variable—suspicion of abuse (none vs some). The criterion for variable consideration was $P < .05$ on bivariate analysis. Relationships between independent variables so identified were examined. Among related variables, only a variable most useful clinically was considered for entry into forward stepwise modeling processes. Interactions among variables retained in final models were examined.

For these analyses, the children were divided into 2 age groups (<6 years vs ≥6 years of age) and 2 health care coverage groups (those with insurance vs those with Medicaid or self-pay coverage). Injury severity was also divided into 2 groups (less severe: Likert 1, 2 vs more severe: Likert 3, 4, or 5).

RESULTS

Patient Demographics

Information was collected on 12 510 office encounters; 78% of encounters were at a suburban office and 22% at an urban location. A total of 659 (5%) visits were for injuries. Visits to a suburban site were significantly more likely to be for injury (6% vs 3%, respectively; $P = .001$). Injured children were older than those not injured (mean age 7.0 years vs 4.8 years, respectively; $P < .0001$) and were more frequently male (55% vs 51%; $P < .02$). The injured and noninjured children did not differ significantly on race/ethnicity, health care coverage, or maternal education. Overall, most children were White (78%), followed in frequency by Hispanic (10%), African-American (7%), and Other (5%) children. Health care was covered by private insurance for 86% of the children, whereas 9% had costs paid by Medicaid, and 4% were self-pay. Of the mothers, 79% of 9716 had some post–high school education.

Patient logs detailing the number of patient visits during the study period were available from 12 of 17 (71%) offices. Response rates were ≥90% at 6 offices, 75%–89% at 3 offices, 50%–74% at 1 office, and <50% at 2 offices.

Practitioner Demographics

After a single mailing seeking 50 study practitioners, 17 (39%) of 43 Pediatric Practice Research Group practices, including 89 practitioners, agreed to participate in the study. All 89 practitioners (100%) at the 17 participating practices completed a Practitioner Questionnaire. The analyses excluded 4 practitioners: 2 physicians who had completed their residency in the past year and thus were unable to respond to questions about events in their past year of primary care practice, and 2 physicians who had included children referred to them for evaluation of suspected child abuse. Thus, the responses of 85 practitioners (96%) were included in the analysis.

Practitioners were 60% female, 87% White, and 89% physicians (97% with pediatrics specialty); 38 of the physicians (49%) had completed residency since 1990. There were 36 practitioners (42%) practicing at an urban office and 49 (58%) at a suburban office. Only 1 practitioner was in solo practice, while 18 (21%) were in a practice that included 2–4 practitioners, and 66 (78%) practiced in groups of 5–13 practitioners.

Practitioner's Previous Experience With Child Abuse

Complete details of practitioners' responses to the questions about their previous experience with child abuse have been reported.[8] In brief, primary care practitioners said they had reported most but not all cases of suspected child abuse. Past negative experiences with CPS and perceived lack of benefit for the child were common reasons given for not reporting. Recent education about child abuse increased the probability that they would report all suspected abuse.

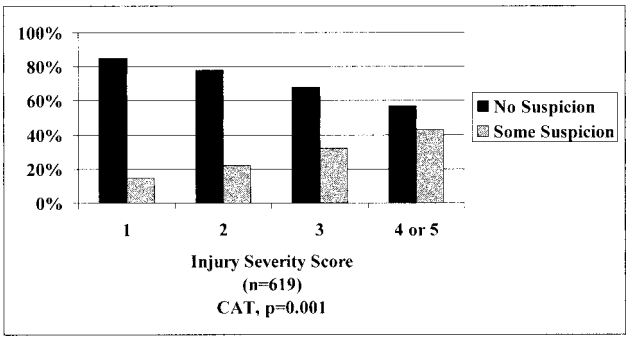

Figure 1. *Comparison of injury severity in patients with no suspicion of abuse and patients with some suspicion of abuse.*

Child Abuse Suspicions

The practitioners rated their suspicion of abuse and a cause of injury for 623 injured children. When they responded to the first question about the suspicion for abuse, they assessed 83%, 16%, and 1% of children with a Suspicion Scale score of 1, 2, and 3–5, respectively. Regarding the cause of the injury, they identified none of the injuries as caused by child abuse, but 30 (4.6%) of the injuries were listed as ''unknown if intentional or accidental.'' When the data from these 2 questions were placed into one of the 3 suspicion categories using the study criteria, these providers indicated that they had ''no suspicion'' of abuse for 492 (79%) of the injury visits, whereas 124 (20%) injuries elicited ''some suspicion'' and 7 (1%) injuries were viewed with ''moderate suspicion.''

Practitioners assigned a severity rating to 619 (94%) of the injuries with 45% assessed as minor or ''1,'' 36% rated as ''2,'' 15% as ''3,'' 4% as ''4,'' and 0% as ''5,'' The severity was related to the level of suspicion, as shown in Figure 1. As the severity of the injury increased, the practitioner was more likely to consider that the injury was suspicious for abuse (CAT, $P = .001$).

''Some Suspicion'' for Abuse

As shown in Table 1, the children with ''some suspicion'' of abuse were significantly younger than the children classified as ''no suspicion'' of abuse. Gender did not differ between the 2 groups. Practitioners were more likely to have ''some suspicion'' of abuse for those children who were African-American or Hispanic (vs White), those whose health care was either self-paid or reimbursed by Medicaid (vs private insurance), and those whose mothers had no college education (vs some college or college graduate education). Children seen in urban practices were more likely to have injuries viewed with ''some suspicion'' of abuse (vs suburban). However, the variables of race/ethnicity, health care coverage, mother's education, and practice location associated with ''some suspicion'' were themselves significantly interrelated on bivariate analysis (χ^2, each $P < .05$).

''Moderate Suspicion'' for Abuse

Practitioners were ''moderately suspicious'' that the injuries of 7 children were caused by abuse. The children were 0–15 years old (median = 8 years) and were predominately female (71%). Two patients were Hispanic, one was African-American, and the rest were White. Six patients had private insurance, one was self-pay, and none had Medicaid health coverage.

Table 1. Comparison of Patients with No Suspicion of Abuse and Patients With Some Suspicion of Abuse

	No Suspicion N = 492 (80%)	Some Suspicion n = 124 (20%)	*P* Value
Age, y (n = 589)	n = 471	n = 118	
• Median (range)	8 y (0–20)	3 y (0–21)	0.0001*
Gender (n = 583)			
• Female	217 (83%)	45 (17%)	NS
• Male	255 (79%)	66 (21%)	
Race/ethnicity (n = 582)			
• White	406 (85%)	72 (15%)	
• Black	17 (53%)	15 (45%)	0.001†
• Hispanic	31 (63%)	18 (37%)	
• Other	18 (78%)	5 (22%)	
Health care (n = 579)			
• Insurance	420 (83%)	87 (17%)	
• Medicaid	32 (68%)	15 (32%)	0.011†
• Self-pay	17 (68%)	8 (32%)	
Mother's education (n = 569)			
• <12 y	29 (69%)	13 (31%)	
• High school graduate	61 (73%)	23 (27%)	0.018†
• Some college	110 (83%)	23 (17%)	
• College graduate	261 (84%)	49 (16%)	
Practice location (n = 513)			
• Urban	76 (59%)	31 (41%)	0.001†
• Suburban	350 (84%)	56 (16%)	

*Mann-Whitney *U* test.
†χ^2.

The mothers of children with moderately suspicious injuries were less likely to have any post–high school education than the other mothers of children with injuries (Fisher's exact test, $P < .01$). The proportion of mothers with some post–high school education decreased as suspicion increased: 80%, 67%, 29% for children in the ''no,'' ''some,'' and ''moderate'' suspicion groups, respectively (CAT, $P = .001$).

According to the parents' reports, 3 patients were hit by an object and suffered either a cut or soft tissue damage. Two children had fractures, 1 from a fall and 1 from an unknown cause. One 14-year-old child was cut with a box cutter. Another child had unspecified injuries from a motor vehicle accident. When providers were asked what they thought was the cause of the injury, they indicated that 3 injuries were intentional but not child abuse, 2 were unknown, and 1 was accidental.

Two cases were noteworthy. The parents indicated that they did not know the cause of a fracture in a child who was less than 1 year of age. The practitioner indicated a ''4'' level of suspicion that the injury was caused by abuse and listed the cause as unknown. Another 15-year-old Hispanic child was hit by an object. The practitioner indicated a ''5'' level of suspicion but said the cause was ''intentional, but not child abuse.''

Table 2. Logistic Regression Analysis: Patient Factors Predicting Some Suspicion for Abuse (n = 458)

	No Suspicion n = 373 (81%) n (%)	Some Suspicion n = 85 (19%) n (%)	Odd Ratios (95% confidence intervals)	
			Unadjusted	Adjusted
Age				
• <6 y	146 (39)	55 (65)	2.9 (1.7, 4.7)	2.9 (1.7, 4.6)
• ≥6 y	227 (61)	30 (35)	1.0 —	1.0 —
Health care				
• Medicaid or self-pay	32 (9)	18 (21)	2.0 (1.5, 5.4)	2.7 (1.4, 5.3)
• Insurance	341 (91)	67 (79)	1.0 —	1.0 —
Practice location				
• Urban	35 (9)	27 (32)	4.5 (2.5, 8.0)	4.5 (2.5, 8.2)
• Suburban	338 (90)	58 (68)	1.0 —	1.0 —

Subset Data

A subset of 57 practitioners (59%) in 10 practices (67%) recorded the presence of any child and family risk factors associated with abuse. When compared to the FS, the patients in the SS were more likely to be seen in suburban practices (98% vs 87%) and to have private insurance (93% vs 88%). ''Some suspicion'' of child abuse rates did not differ between SS and non-SS practices.

The practitioners identified 33 child and family risk factors in 26 childhood injuries. They indicated no risk factors for 420 injuries. The practitioners indicated that 12 parents had delayed in seeking care for their child's injury; 5 children had injuries not compatible with the history; 5 children had experienced many injuries in the past; 2 children had several injuries of different ages; and 1 child had an injury not compatible with his or her developmental level. The providers reported social concerns, including the following: 3 families had a history of drug/alcohol abuse; 2 families had demonstrated poor bonding or relationships with their children; 1 parent was a victim of domestic violence or previous child abuse; 1 family had little social support; and 1 family had previously been involved with CPS.

Three of the patients that were categorized as ''moderate suspicion'' of abuse were included in the SS. The provider indicated that 1 child on the list had 2 risk factors—the injury was not compatible with the history and the parents delayed in seeking medical care for this injury.

Impact of the Provider's Previous Experience

The data were examined for evidence of an association between the practitioner's education about child abuse and his assessment of likelihood that an injury was suspicious for abuse. Practitioners who received no education about child abuse in the past 5 years were more likely to classify all injuries seen as *not* suspicious for abuse than practitioners who had been educated about child abuse in that time (χ^2, $P = .003$).

There was no statistically significant association between the likelihood of a practitioner's categorizing any injury as suspicious for abuse and any of the following variables related to previous reports to CPS: perception of likelihood of future reporting; perception of benefit to the family; previous negative consequences suffered by practitioner; perception of benefit to the child; any previous report to CPS; and availability of resources to assist in assessing child abuse. The sex of the practitioner also showed no effect.

Multivariate Analysis

Full Sample

Complete information was available for 458 of the 659 injury encounters. Multivariate analysis was conducted for these 458 injured children with complete information to examine the association of child characteristics and practice location (independent variables) on the dependent variable–practitioner suspicion of abuse. Child age, health care coverage, race/ethnicity, maternal education, and practice location were all significantly related to practitioner suspicion of abuse on bivariate analyses. However, the latter 4 variables were also significantly interrelated. In the modeling procedure, we selected health care coverage for entry consideration rather than the other variables, because practitioners are more likely to have information about health care coverage than maternal education. In addition, health care coverage is a better indicator of socioeconomic status than practice location, race, and ethnicity. Both age and health care coverage significantly entered and were retained in the model. As shown in Table 2, younger children and children with Medicaid or self-pay medical coverage were more likely to be viewed as having injuries warranting ''some'' suspicion for abuse as compared to older and privately insured patients.

Subset Sample

A separate multivariate analysis was conducted for the 318 children who had risk factors for abuse assessed and who had complete demographic information. This analysis evaluated the influence of child and family characteristics, injury severity, and risk factor identification (independent variables) on the dependent variable, practitioner suspicion of abuse (none vs some). Variables significantly related to suspicion of abuse (and therefore considered in the modeling process) included child age, injury severity, risk factor identification, practitioner education about child abuse, and child race (White vs Other). For this sample, health care coverage, race, maternal education, and practice location were not significant in bivariate analysis

Table 3. Logistic Regression Analysis: Patient and Provider Factors Predicting Some suspicion for Abuse (n = 318)

	No Suspicion n = 263 (83%) n (%)	Some Suspicion n = 55 (17%) n (%)	Odds Ratios (95% confidence intervals)	
			Unadjusted	Adjusted
Age				
• <6 y	105 (60)	33 (60)	2.3 (1.2, 4.1)	2.9 (1.5, 5.6)
• ≥6 y	158 (40)	22 (40)	1.0 —	1.0 —
Injury severity*				
• 3, 4, or 5	35 (13)	19 (34)	3.4 (1.7, 6.6)	3.4 (1.7, 7.0)
• 1 or 2	228 (87)	36 (66)	1.0 —	1.0 —
Risk factors				
• ≥1	8 (3)	8 (15)	5.4 (1.9, 15.2)	4.8 (1.6, 14.6)
• None	255 (97)	47 (85)	1.0 —	1.0 —
Provider education about child abuse				
• Some in 5 y	144 (55)	42 (76)	2.7 (1.4, 5.2)	2.9 (1.4, 5.8)
• None in 5 y	119 (45)	13 (24)	1.0 —	1.0 —

*Injury severity: Likert scale, 1 = minor, 5 = serious.

and so were not considered in the modeling process. As shown in Table 3, child age, injury severity, risk factor identification, and provider education significantly entered and were retained in the model. Suspicion of abuse was more common for children who were younger, had more severe injuries, and had a risk factor identified, and among practitioners with more recent education about child abuse.

DISCUSSION

This prospective study addressed questions about how practitioners assess the likelihood a childhood injury was caused by child abuse. As we hypothesized, practitioners attribute variable degrees of suspicion to the childhood injuries they evaluate. Practitioners rated 1% of the injuries in the sample as having a ''moderate suspicion'' of abuse and 20% as having ''some suspicion'' of abuse.

We found that practitioners experience significant diagnostic uncertainty when evaluating injury etiology; 4.6% of the injuries were classified as ''unknown if accidental or intentional.'' A possible explanation for this diagnostic uncertainty is that for some injuries, practitioners do not obtain sufficient history to enable them to make a causal diagnosis.

This study also confirmed our second hypothesis—that practitioner and patient variables affected the practitioner's suspicion that an injury was caused by abuse. The practitioners in our study were more likely to suspect abuse in younger children and in children with more severe injuries. We found that a child with injuries identified as ''some suspicion'' was more likely to have a less-educated mother, have Medicaid or self-pay for health care coverage, be African-American and/or Hispanic, and receive medical care in an urban office setting. These variables were all highly interrelated and are probably all markers of poverty in our sample. These results are consistent with findings of other studies that found that abuse was identified more frequently in children who are young, impoverished, from minority backgrounds, and whose mothers had less education.[14–18] It remains unclear whether this reflects actual differences in abuse rates and/or provider bias.

In addition, practitioners were more likely to suspect abuse if they identified risk factors for abuse in the family. When evaluating a child for possible abuse, health care practitioners are taught to look for family stresses or other factors that might place a child at risk (eg, the presence of domestic violence, substance abuse, and previous involvement with CPS). In the SS, a significant number of the child injuries with ''some suspicion'' had family risk factors identified. These risk factors probably caused some practitioners to increase their level of suspicion.

Practitioners who had received some education about child abuse in the past 5 years were more likely to suspect that an injury was caused by abuse. This finding corroborates a conclusion we reached in a previous phase of this study. Practitioners, when asked about their past experience reporting child abuse, were more likely to have reported all suspected abuse to CPS if they had received more recent education about child abuse.[8]

The limitations of our study include the following. Information was collected from relatively few practitioners in one geographic area, and the practitioners' experience is mostly with one state (Illinois) CPS system. Practitioners in other states may have different support services available to them and may experience a different response from CPS. Second, because it was not the goal of this study to compare risk factors in urban and suburban settings, the SS were randomly assigned and consisted mainly of suburban offices. A larger study that could compare risk factors in urban and suburban patients would provide useful information. The numbers of children assessed as ''moderate suspicion'' for abuse were too few to make any statement about risk factor influence on identifying abuse in that group. Further research on this is needed. Third, the results are based on practitioners' self-reports, and we could not measure the validity of their reports. Fourth, since this study did not ask practitioners if they reported an injury to CPS, no conclusions can be drawn about the level of suspicion causing a provider to notify CPS. Finally, the study lacked sufficient power to detect the effects of prior experience with CPS on practitioner behavior. Because of the small number of children each

practitioner categorized as ''some'' or ''moderate'' suspicion for abuse, we estimate that we would have required a sample including approximately twice as many practitioners as were included in this study to have an 80% likelihood of detecting a clinically and statistically meaningful effect of this prior experience on the practitioner's behavior. Thus, the failure to detect such an effect does not preclude its existence.

CONCLUSION

This prospective pilot study of childhood injuries demonstrated that primary care practitioners attribute variable levels of suspicion that child abuse may have caused a child's injury. These Chicago-area urban and suburban practitioners had some level of suspicion that 21% of the childhood injuries they evaluated may have been caused by abuse. Patient factors, including young age, maternal education, health care coverage, minority race/ethnicity, practice setting, injury severity, and risk factors for abuse, affected practitioner suspicion. Practitioner education about child abuse was the only practitioner variable that affected the likelihood a practitioner would suspect abuse.

This study demonstrates variables affecting the decision-making process for practitioners when they are confronted with childhood injuries. More information is needed describing how practitioners view injuries and make decisions about the etiology of those injuries. Currently, we have little information available to guide the primary care practitioner in evaluating and following the group of children about whom they have ''some suspicion'' of abuse.

What, then, are the implications of our study? When evaluating childhood injuries in their offices, the practitioners in this study did not identify abuse as a cause of injury. In nearly 1 in 5 cases, however, they have some suspicion that an injury could have been caused by abuse. Further research is needed to learn more about the *level of suspicion needed before a practitioner acts on suspected abuse*, either by reporting or referring for further evaluation. In addition, more research is needed about the subsequent course of those children with potentially inflicted injuries in order to improve clinical decision making and management.

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