

FATAL CHILD ABUSE IN GEORGIA: THE EPIDEMIOLOGY OF SEVERE PHYSICAL CHILD ABUSE

JANINE JASON, M.D.

Center for Health Promotion and Education, Centers for Disease Control, Atlanta, Georgia 30333

NATHAN D. ANDERECK, A.C.S.W.

Director of the Office of Program Planning and Development, Division of Family and Children Services,
Georgia Department of Human Resources, Atlanta, Georgia 30308

Abstract—Decisions about the occurrence of child abuse are increasingly difficult to make because concepts of what qualifies as reportable child abuse may be broadening. We examined this question by comparing 51 fatal child abuse cases occurring in Georgia between July 1975 and December 1979 to non-fatal cases and to the Georgia population. Overall rates of fatal child abuse were higher for male perpetrators compared with female and black perpetrators compared with white. However, the latter finding varied with economic and geographic status. The highest child abuse fatality rates were found in poor, rural, white families (3.3/100,000 children) and in poor, urban, black families (2.4/100,000 children). Risk factors for fatal abuse included early childhood (RR 6:1), parental teenage childbearing (RR 4:1), and low socio-economic status. These characteristics were similar to those of the severe child abuse cases noted in the early child abuse literature. Non-fatal cases did not clearly share these risk factors. Severe abuse, here represented by fatal cases, is a distinct subset of reported child abuse, but characteristics associated with it are frequently attributed to all reportable child abuse. Medical personnel should be aware that they cannot rely on the presence or absence of these characteristics in screening for risk of reportable child abuse. Child abuse research should use restricted, stated case definitions. When intervention and prevention programs are being organized, they should not generalize research findings to all forms of child abuse.

Key Words—Child abuse; Homicide; Risk factors; Epidemiology; Physical abuse

Résumé—Il devient de plus en plus difficile de prendre des décisions dans les cas de violence à l'égard d'enfants parce que la définition de ce qu'on appelle violence est en train de s'élargir. Les auteurs se sont efforcés de trouver une solution à ce problème en comparant 51 cas de violence ayant conduit à la mort dans l'Etat de Géorgie sur une période de 4 ans (1975-1979) aux autres cas rapportés de violence n'ayant pas amené une issue fatale. La fréquence de l'infanticide s'est révélée supérieure lorsque l'auteur des sévices était un homme et lorsque l'auteur était de race noire. Cependant cette trouvaille doit être qualifiée par le fait que la différence varie selon la position économique ou géographique des personnes en cause. Les issues fatales survenant à la suite de sévices physiques sont plus fréquentes dans les familles rurales de race blanche, pauvres (3,3/100'000 enfants) et aussi dans les familles de race noire urbaines et pauvres également (2,4/100'000 enfants). Les facteurs de risque en ce qui concerne les cas se terminant par le décès de l'enfant sont les suivants: enfants très jeunes, nourrissons (risque: 6/1); parents adolescents (risque 4/1) et conditions socio-économiques défavorables. Ces caractéristiques des cas avec issue fatale sont les mêmes que celles qu'on avait relevé dans les graves situations de violence à enfant au début lorsqu'on a commencé à publier au sujet de la maltraitance d'enfants. Par contre les cas de violence à l'égard d'enfants qui n'ont pas résulté en la mort de ceux-ci ne présentent pas les caractéristiques énumérées cidessus. Les auteurs soulignent que les cas graves de maltraitance, c'est-à-dire ceux qui se terminent par la mort, constituent un sous-groupe bien défini à l'intérieur de la problématique de la violence à enfants. Il est faux de rapporter les caractéristiques associées à ce sous-groupe à tous les cas de violence physique à l'égard d'enfants. En d'autres termes, les caractéristiques dans les cas avec issue fatale ne sont pas les mêmes que celles des cas non fatals. En conséquence le personnel médical et paramédical devrait savoir qu'il ne faut pas rechercher seulement les caractéristiques associées aux cas graves pour se diriger dans le dépistage des autres cas de violence, qui sont soumis eux-aussi à la législation exigeant l'annonce aux autorités. De même lorsqu'on organise des plans de prévention, on ne devrait pas se laisser enfermer dans une définition uniforme de ce qu'il faut rechercher.

The authors would like to thank Drs. R. Rochat, C. W. Tyler, and W. R. Jarvis for their invaluable criticism and advice.

Data supplied by the Federal Bureau of Investigations-Uniform Crime Reports and by the Georgia Department of Human Resources were essential to this analysis and the generous assistance of these agencies was much appreciated.

INTRODUCTION

PHYSICAL CHILD ABUSE is recognized as a major cause of pediatric trauma and mortality [1, 2]. The incidence of mortality due to child abuse has been estimated at greater than 1,000 deaths per year in the United States [3]. Unfortunately, the term child abuse is frequently used without being defined and is open to subjective interpretation. We suggest that concepts of what constitutes child abuse are broadening. Reportable child abuse now includes neglect, maltreatment, and degrees of physical abuse not represented by much of the child abuse literature. Nonetheless, classic risk factors [4] are used to assess a child's chances of having been abused and of being abused in the future. These presumed risk factors include the period of infancy for the child; early childbearing, early parenthood or youthfulness for the parent, and single-parent households or low socioeconomic status for the family.

Fatalities occurring directly from trauma incurred during abuse are one group representative of severe physical child abuse. We used 51 cases of fatal confirmed physical or sexual child abuse from the Georgia child abuse registry to examine the issue of risk factors. These cases were compared epidemiologically to child homicide, to nonfatal child abuse cases, and to the comparable Georgia population.

MATERIALS AND METHODS

From July 1975 through December 1979, 4,221 cases of physical or sexual child abuse were confirmed by the Georgia Department of Protective Services. Details of this reporting system are discussed elsewhere [5, 6]. Briefly, any individual, medical or health facility, or agency can report a case of suspected abuse of a person less than 18 years of age to the local Protective Services Department. Members of this agency investigate the incident and obtain information about the child and his or her family. After investigation, cases are classified as follows: (1) confirmed, if investigation leads to substantiation of abuse; (2) non-confirmable, if suspicion remains but cannot be documented; and (3) ruled-out, if the investigator determines that injuries cannot be attributed to child abuse. Data concerning cases of abuse are then supplied to the Georgia central registry. From July 1975 through December 1979, the Georgia Protective Services Department confirmed 49 fatalities involving physical abuse and two fatalities involving sexual abuse. (Cases of neglect alone were not included in this registry over this time period.) These deaths occurred secondary to the physical trauma incurred at the time of abuse and were not due to any associated neglect. They are herein defined as child abuse fatalities. Those occurring in association with sexual abuse will be discussed separately from those occurring in the absence of any signs of sexual molestation. Those not associated with sexual abuse are herein defined as physical child abuse fatalities and will be the group used in most of our analysis. When mentioned herein, reporting biases were assessed by comparing the confirmed and the ruled-out cases to the general population. This technique is discussed in detail elsewhere [5]. Briefly, ruled-out cases represent persons under surveillance by this reporting system. A characteristic or factor can be determined to be associated with increased risk only if its prevalence in the confirmed category exceeds its prevalence in both the general population and in the ruled-out category. Otherwise, risk and reporting bias cannot be differentiated.

Receipt or nonreceipt of Aid to Families with Dependent Children (AFDC) at the time of abuse is used as an indicator of economic status in this analysis. Population data in regard to AFDC are

supplied by the Georgia Bureau of Family and Children Services. Data concerning family size are derived from information from the U.S. Census Bureau [7, 8], and pertain to all U.S. families with a child less than age 18. This population estimate is adjusted for the racial and parental composition of abused children's families. The percentage of mothers expected to be less than age 20 at their first live birth is calculated on the basis of a sample of Georgia primiparous females from the Georgia Matching of Records for Births and Infant Deaths Report, 1974–1978 (unpublished data). This estimate is adjusted for the racial distribution of children whose abuse is confirmed. Data concerning homicides reported to law enforcement agencies for 1976–79 were supplied by the Federal Bureau of Investigations-Uniform Crime Reporting System (FBI-UCR) (unpublished data). Statistical analyses are done using goodness of fit or Mantel-Haenszel extension chi square techniques [9].

RESULTS

Fatalities Associated with Reported Physical Abuse

The overall reported physical child abuse fatality rate for Georgia was 0.7/100,000 persons less than age 18 years. The incidence of reported child abuse fatality was greatest for children less than 1 year of age (Figure 1). The relationship of the perpetrator to the abused child was predominantly parental although other relationships, including "strangers," were also represented. Age-specific rates of all child homicide in Georgia for 1976–79 are represented in Figure 2. A comparison of FBI-UCR and Georgia child abuse data shows that the child abuse data does not even suggest the extent of non-parentally perpetrated homicide that occurred in that state.

Fatal and nonfatal physical child abuse victims were similar in several respects. There was no significant difference in proportion of only children abused fatally (33%) and nonfatally (31%). Both groups had fewer only children than a comparable U.S. population (38%). In families with

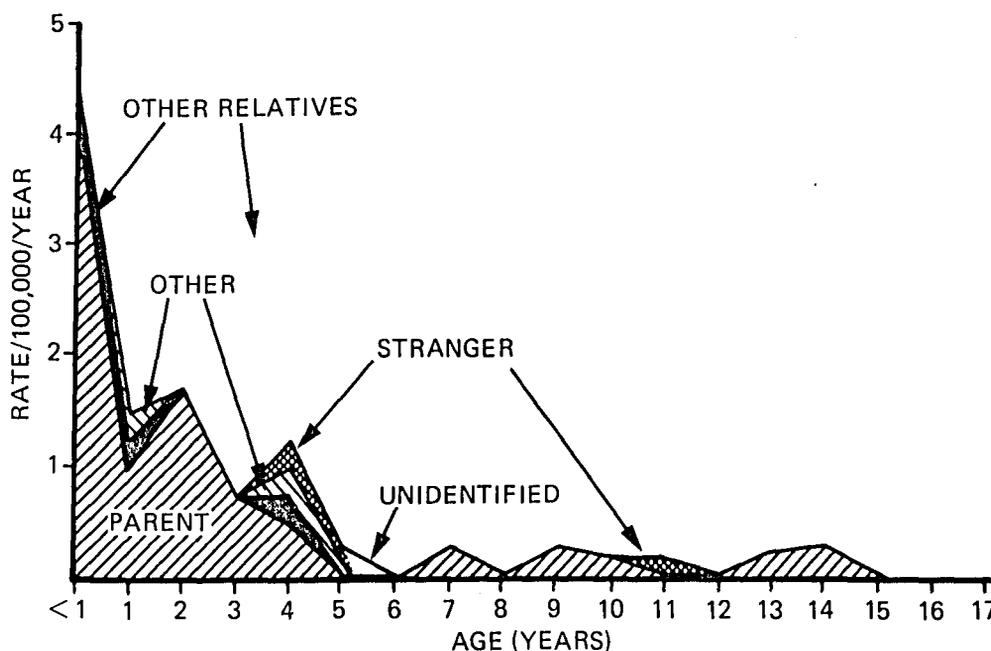


Figure 1. Incidence of Confirmed Child Abuse Fatality by Age of Child by Relation of Perpetrator, Georgia, July 1975–1979

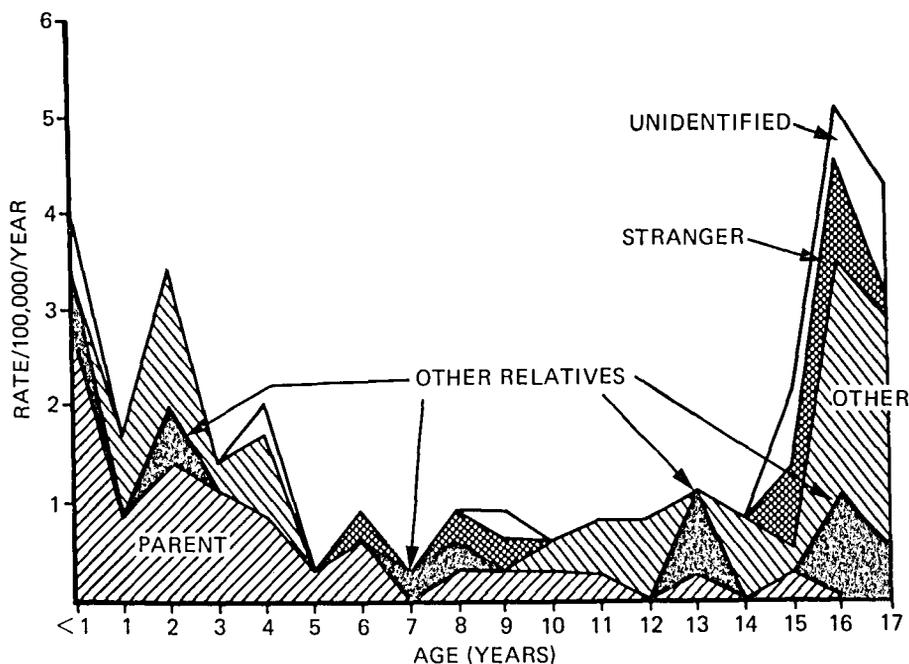


Figure 2. Incidence of Child Homicide by Age of Victim and by Relationship of perpetrator Georgia, 1976-1979

more than one child, the fatally abused child was most frequently the youngest of the sibship (58%), and the nonfatally abused child was most frequently the eldest (44%). This difference, however, was artifactual and attributable to the age distributions of the fatally and nonfatally abused and disappeared with stratification by child's age. The proportion of victims with reported previous abuse did not differ for fatal and nonfatal cases even with stratification by the age of the child.

Observed injuries are listed in Tables 1 and 2 and appear to represent the severity of applied force. The following injuries were both more frequent and had a higher associated case-fatality rate in younger children compared with older children: hematomas, malnutrition, internal injuries, and multiple injuries. Bruises, wounds, and abrasions were common in all age groups but were more frequently associated with fatality at younger ages. Bone fracture, skull fracture, brain damage, and burns were more frequent for infants; however, the case fatality rates for the first three were highest for children aged 3-5 years and case fatality rates for burns were highest for children aged 9-11 years.

For physical abuse, mothers of the fatally abused children began childbearing at an earlier age than mothers of the nonfatally abused children. Seventy-three percent of the former ($n=40$) and 47% of the latter ($n=2935$) were less than age 20 years at the birth of their first child. According to population data, 40% would have been expected to have been less than age 20 years at their first live birth. Children whose mothers began childbearing at less than age 20 years were at four-fold higher risk of fatal abuse (95% Confidence Interval: 2.1-7.5) but at only 1.3 times higher risk of nonfatal abuse compared to children whose mothers began childbearing after age 20 years. The apparent increased risk for nonfatal abuse could, in fact, actually reflect reporting bias [5]. Where present in the household, fathers of the fatally abused children were younger at commencement of fatherhood than those of the nonfatally abused children. Twenty-seven percent of the former ($n=26$) and 18% of the latter ($n=2549$) were less than age 20 years when their first live child was born. (Population data were unavailable for father's age at first live birth.)

Table 1. Injuries Observed in Confirmed Physically Abused Children by Age of the Child (Percent Distribution) Georgia, July 1975 – December 1979

Type of Injury	Percent in Each Age Group						Total %	Total No.
	(Age in Years)							
	0-2	3-5	6-8	9-11	12-14	15-17		
Brain damage	67	22	0	11	0	0	100	(n = 3486)* 9
Internal injuries	32	41	14	9	4	0	100	22
Skull fracture	85	7	5	3	0	0	100	40
Poisoning	50	33	17	0	0	0	100	12
Malnutrition	68	13	7	10	2	0	100	73
Bone fracture	69	12	4	4	3	8	100	123
Burns	47	25	14	7	4	3	100	169
Hematoma	43	18	18	3	6	12	100	33
Multiple injuries	27	17	18	13	13	12	100	709
Wounds	23	16	16	14	14	17	100	208
Abrasions	18	21	18	15	18	10	100	540
Other	23	19	16	17	14	11	100	322
Bruises	18	20	18	16	16	12	100	2355
None apparent	18	16	12	16	21	17	100	377
Sprains	21	14	14	27	17	7	100	29
Dismemberment	0	0	0	0	0	100	100	1
Freezing	0	100	0	0	0	0	100	1

*Up to four types of injury may be recorded for each case; therefore, total number of listed injuries exceeds the total number of cases. The number in parentheses represents the total number of confirmed physical child abuse cases.

Table 2. Case Fatality Rates* by Injuries Observed and Age of the Victim, Confirmed Physical Child Abuse, Georgia, July 1975 – December 1979

Type of Injury	Age in Years						Total Rates
	0-2	3-5	6-8	9-11	12-14	15-17	
Brain damage	33	100	0	0	0	0	56
Internal injuries	43	0	0	50	0	0	17
Skull fracture	18	33	0	0	0	0	17
Poisoning	0	0	50	0	0	0	8
Malnutrition	10	0	0	0	0	0	7
Bone fracture	7	13	0	0	0	0	6
Burns	8	5	0	9	0	0	5
Hematoma	7	0	0	0	0	0	3
Multiple injuries	7	3	0	1	2	0	3
Wounds	9	3	0	0	0	0	2
Abrasions	4	2	0	0	2	0	2
Other	9	7	0	4	2	0	1
Bruises	2	1	0	1	1	0	1
None apparent	0	0	0	0	0	0	-
Sprains	0	0	0	0	0	0	-
Dismemberment	0	0	0	0	0	0	-
Freezing	0	0	0	0	0	0	-

*Deaths/100 cases of confirmed physical child abuse in each age group.

Mothers who perpetrated fatal abuse of their children were younger than those who perpetrated nonfatal abuse. Thirty-seven percent of the former ($n = 16$) and 9% of the latter ($n = 964$) were less than age 20 years at the time they committed abuse. Their mean ages were 23 years and 29 years, respectively, at the time of abuse. These age differences persisted even when maternal age was stratified by child's age although numbers for fatal cases in each strata were quite small. When the child's age was taken into account, other categories of perpetrators were not younger for fatal abuse than for nonfatal abuse.

**Table 3. Confirmed Fatal Child Abuse Rates,*
by Race and Sex of Perpetrator, Georgia,
July 1975–December 1979**

Race	Male (n = 25)	Female (n = 15)	Total (n = 40)
White (n = 21)	2.4	1.1	1.7
Black (n = 19)	6.0	3.6	4.7
Total (n = 40)	3.2	1.8	2.5

*Rate per 1,000,000 persons aged 19 years and older

**Table 4. Confirmed Fatal Child Abuse Rates, by Race
and Economic Status of the Involved Children,
Georgia, July 1975–December 1979**

Aid Status	White (n = 21)	Black (n = 27)	Total (n = 48)
Family on AFDC (n = 15)	2.5	1.8	2.0
Family not on AFDC (n = 33)	0.3	0.9	0.5
Total (n = 48)	0.4	1.2	0.7

*Persons in Georgia age < 18 years

The incidence of reported physical child abuse fatality varied with the sex and race of the perpetrator (Table 3) and the race and economic status of the child's family (Table 4). The incidence of fatal abuse by male perpetrators was 1.8 times that of female perpetrators (95% CI: 1.0–3.5); and black perpetrators 2.8 times that of white perpetrators (95% CI: 1.5–5.0). Race specific rates varied with economic status as well as urban/rural residence. The incidence of fatal abuse was comparable for whites and blacks on AFDC although analysis was limited by the fact that the number of whites on AFDC was low. For families not on AFDC, the incidence for black children was 2.6 times that for white children (95% CI: 1.4–5.1). Overall, children on AFDC were at 3.7 times higher risk of fatal abuse than those not on AFDC (95% CI: 2.1–6.6).

Their risk for nonfatal abuse was 2.9 times higher, and the latter could be indicative of reporting bias and not risk [5]. Children with the highest incidence of fatal abuse were rural whites on AFDC (3.3/100,000 children) and urban blacks on AFDC (2.4/100,000 children).

The characteristics of fatally abused children and their families are outlined in Table 5. The incidence of reported physical child abuse fatality did not vary significantly with the child's sex.

**Table 5. Confirmed Fatal Child Abuse Rates, by Characteristics of
the Child and the Family, Georgia, July 1975–December 1979**

Characteristics	Rate per 100,000 children (n = 48)
Sex: Male	7.0
Female	6.0
Race: White	4.0
Black	12.0
Age: Less than 3 years	17.0
Equal to or greater than 3 years	3.0
Geographic residence: Urban	8.0
Rural	6.0
Parental Composition of Household	
White: Mother and father present	4.0
Mother sole head of household	6.0
Black: Mother and father present	13.0
Mother sole head of household	14.0
AFDC status: Receiving	20.0
Not receiving	5.0

The incidence of fatal abuse for blacks was 2.7 times that for whites, while their relative rate of nonfatal abuse was 1:1. Children less than 3 years of age were at 5.9 times greater risk of fatal abuse than other children, but at only 1.3 times greater risk of nonfatal abuse. The incidence of fatal abuse tended to be greater in households with a mother as the sole head compared with two-parent households, but this difference was not significant. In fact, in three cases of fatal abuse where the father did not reside with the child, the perpetrator was the child's father.

Fatalities Associated with Reported Sexual Abuse

Two fatalities associated with sexual abuse occurred during this time period. One case involved father/daughter incest in a white, two-parent, rural household that had never received AFDC. The child was 9 years old and had one younger sister. The father was aged 30 years at the time of the fatality. Previous abuse had been suspected. Injuries were unspecified. Court action was taken. The second victim was a 17-year-old black female, the eldest of 10 children in a two-parent rural household on AFDC. A 16-year-old female relative was the perpetrator. Injuries included burns and bone fractures. Court action was not taken.

DISCUSSION

Medical and social services personnel are frequently faced with difficult decisions about whether a child has been abused or is at risk of abuse. These decisions are complicated by the legal requirement that physicians must report child abuse to the appropriate state agency [2]. We suggest that with increasing awareness of child abuse and neglect on the part of the reporting public, reported child abuse is including physically, albeit not necessarily psychologically, less severe forms of trauma. Individuals and agencies guided in their decisions by using correlates of child abuse noted in the early literature may find that these are not pertinent to reportable child abuse today.

Data obtained from the FBI-UCR indicate that deaths reported to the Georgia Department of Protective Services generally reflect a distinct subset of child homicide cases occurring in that state. This subset consists largely of homicides perpetrated by a parent upon a young child.* We suggest that these cases of reported fatal child abuse can be used analytically to represent the most severe forms of physical child abuse perpetrated directly by a caretaker. Other groups could have been selected for this analysis, e.g., cases of head trauma or fractures as well as fatalities. We have chosen as our case group the one least open to criticism in regard to being considered severely injured. These fatalities occurred directly because of the physical trauma incurred by the child.

When fatal cases in Georgia were used as an indicator of reported severe physical abuse, the findings were consistent with previous reports in several respects: (1) Rates were highest for children in the vulnerable and dependent period of infancy [2, 4, 10, 11]. (2) It has been suggested that abuse is associated with young mothers [4, 11]. Our data on fatal cases were consistent with this when the mother was the perpetrator; our data on nonfatal abuse were not [5]. (3) We found fatal cases in Georgia associated with early childbearing, early fatherhood, and low socioeconomic status; this is comparable to severe abuse cases in the literature [4, 11]. Nonfatal cases were not clearly associated with these factors. These data support the hypothesis that socioeconomic stress and parental immaturity may be factors involved in severe physical child abuse, but not necessarily in all reportable child abuse.

Our findings on fatal child abuse differ in several respects from those of the first national survey

*It should be noted that protective services data do not appear to contain all cases within even this subset of child homicide, as suggested by Figures 1 and 2 and in data presented in references [2] and [12]. Furthermore, even vital statistics underrecord the full extent of child homicide [13]. Protective services do, however, provide the most detailed information available concerning the described child homicide..

in 1967, which initiated some early concepts of physical child abuse [4]. We did not find fatal injury inflicted by women more frequently than by men, nor did it occur in single mother households significantly more than in two-parent households. In fact, males had a higher incidence of fatal perpetration of abuse although females presumably had the dominant role in childcare. Three cases of fatal abuse in single-mother households were perpetrated by the victim's nonresident father. Fatality rates varied with both race and socioeconomic status; however, these relationships were more complex than previously noted. When the family was of a poverty level requiring AFDC, racial differences did not exist. For families not on AFDC, the incidence for blacks was higher than for whites. It is entirely possible that this represents socioeconomic variation within the nonrecipient population and not racial differences. Rates of reported fatal abuse also varied with geographic locality; rural whites and urban blacks on AFDC had the highest physical abuse fatality rates.

The patterns of injuries we have presented may reflect several aspects of a child's development and physical vulnerability: (1) Less force is needed to produce both visible trauma and serious sequelae in a young child compared with an older child. (2) Fractures, if seen as an indication of force applied, may reflect greater force in the case of an older child than of an infant. Progressive bony calcification of long bones and suture closure of the skull make an older child relatively resilient to outright fracture. Thus, as seen in our data, fractures could be expected to be associated with greater force and therefore higher case fatality rates in older children than in infants. (3) Certain types of abuse appear to be most common at certain ages, e.g., burns and poisoning in infants and toddlers and burns in preadolescents. These findings may reflect patterns of caretaker/child interactions specific for these developmental stages.

In summary, fatal child abuse reports provide a means of examining the most severe physical child abuse. Distinct risk factors and situations appear to be associated with a fatal outcome to reported abuse. However, they are not to be associated with all abuse as currently defined by protective services systems. Infancy is a high risk period. Parental and family factors include early childbearing, early fatherhood, a young mother, and low socioeconomic status. The factors specific for fatal cases appear comparable to those suggested for all abuse noted in the early abuse literature. This is probably a reflection of a narrower definition of abuse at that time. In addition, certain previously noted risk factors are not supported by our analysis. Specifically, mothers did not fatally abuse more than fathers and single-mother households were not found to be associated with increased risk.

Implications

Protective services, social services, and medical personnel should be aware that previously described risk factors for child abuse, if valid, may pertain only to the most severe forms of abuse. They should not overgeneralize published risk factors and should be aware that they cannot rely on the presence or absence of these characteristics in screening for risk of reportable child abuse. Child abuse research should use restricted, stated case definitions. When intervention and prevention programs are being organized, they should not generalize research findings to all forms of child abuse.

REFERENCES

1. JUSTICE, B., and DUNCAN, D., Child abuse in terms of a public health model. *Ment. Hlth. Soc.* 4:110-114 (1977).
2. National analysis of official child abuse and neglect reporting. American Humane Association, Denver, Colorado (1978).
3. BURGDORF, K., Recognition and reporting of a child maltreatment: Study findings. National study of the incidence and severity of child abuse and neglect. The National Center on Child Abuse and Neglect. DHHS Publication #81-30325 (1981).
4. GIL, D. G., *Violence against children*. Harvard University Press, Cambridge, Massachusetts (1970).

5. JASON, J., ANDERECK, N. D., MARKS, J., and TYLER, C. W., Child abuse in Georgia: A method to evaluate risk factors and reporting bias. *American Journal of Public Health* **72**:1353-1358 (1982).
6. McCARTHY, B. J., ROCHAT, R. W., CUNDIFF, B., GOULD, P. A., and QUAVE, S., The child abuse registry in Georgia: 3 years of experience. *Southern Medical Journal* **74**:11-16 (1981).
7. *1970 Census of the Population*, United States Bureau of the Census.
8. Population characteristics. *Current Population Reports*, Series P-20, #349, (February 1980).
9. MANTEL, N., HAENSZEL, W., Statistical aspects of the analysis of data from retrospective studies of disease. *Journal of the National Cancer Institute* **22**:719-748 (1959).
10. KEMPE, C H., SILVERMAN, F. N., STEELE, B. F., DROEGEMUELLER, W., and SILVER, H. K., The battered child syndrome. *Journal of the American Medical Association* **181**:17-24 (1962).
11. BALDWIN, J. A., OLIVER, J. E., Epidemiology and family characteristics of severely abused children. *British Journal of Preventive and Social Medicine* **29**:205-221 (1975).
12. Child homicide-United States. Morbidity and Mortality Weekly Report 1982; 31#22:292-294.
13. JASON, J., CARPENTER, M. M., TYLER, C. W., Underrecording of infant homicide in the United States. *American Journal of Public Health* **73**:195-197 (1983).