

FACTORS ASSOCIATED WITH A HISTORY OF FIREARM INJURIES IN JUVENILE DRUG TRAFFICKERS AND VIOLENT JUVENILE OFFENDERS

Colleen R. McLaughlin (Virginia Commonwealth University), Scott M. Reiner, Benjamin W. Smith, Dennis E. Waite (University of Virginia), Patricia N. Reams (Virginia Commonwealth University), Timothy F. Joost, Department of Juvenile Justice, Virginia, and Alfred S. Gervin, FACS, FACEP, FCCM

Abstract

Firearm injuries have reached epidemic proportions within both juvenile and adult correctional populations. Relatively little is known, however, about the individual and community factors associated with an increased risk for violence in offender populations. Understanding these correlates of violent victimization would represent the first step in the identification of putative risk factors; permitting the development of meaningful and effective prevention programs. The primary objective of the present study was to develop a model of individual and community factors associated with firearm injury prevalence in a sample of incarcerated juvenile drug traffickers ($n = 217$), and violent juvenile offenders ($n = 239$). The results indicated that the pattern of offending, drug selling or violence, was important in determining the particular factors associated with firearm injuries in juvenile offenders. The results were consistent with the hypothesis that juvenile drug traffickers may have been injured as a result of a general inability to function effectively within the drug trafficking arena, or adequately judge dangerous situations, including situations where they were at increased risk for robbery or other violent victimization. The profile that emerged for the injured violent offenders suggested that they may have precipitated a violent attack through an aggressive interactional style, or the predatory nature of their offending. A preliminary review of community variables indicated that the firearm injury prevalence for the two different offender groups varied across locality, again suggesting that community or environmental factors may interact with offending in defining the overall risk for injury.

INTRODUCTION

Recent evidence indicates that firearm injuries have reached epidemic proportions within both juvenile and adult offender populations (May, Ferguson, Ferguson, Cronin 1995; McLaughlin, Reiner, Smith, Waite, Reams, Joost, Gervin 1996). These findings support the suggestion that the single best predictor for violent victimization may be involvement in criminal offending (May et al 1995; McLaughlin, Daniel, Reiner, Waite, Reams, Joost, Anderson, Gervin under review). Relatively little is known, however, about the individual and community factors associated with an increased risk for violence in offender populations. The potential consequences of intentional injuries in offenders are significant (Farrow 1991). Prior research links adverse reactions to traumatic or stressful events, as could be represented by an intentional violent injury, with increased social maladjustment including depression and suicidal ideation, as well as increases in violent acts and increased criminal offending (Armfield 1994; Elliot, Huizinga, Ageton 1985). Studies indicate that younger, economically deprived individuals with poor support systems, diminished identification with the majority culture, less education, a history of childhood behavior problems, and physical abuse may be particularly vulnerable to developing an adverse reaction to a traumatic or stressful event (Armfield 1994; Elliot et al

1985). This would not be an unusual profile for a juvenile offender population.

Involvement in drug selling, violence and an increased prevalence of penetrating trauma pose serious threats to the health and well-being of juvenile offenders. These behaviors also significantly impact the larger society through the increased demands placed on the legal, health care and social service systems serving at the forefront of this epidemic; as well as the climate of fear that saturates communities inundated with drugs and violence (Reiss, Roth 1993). Understanding the correlates of violent victimization in offender populations would represent the first step in the identification of putative risk factors; permitting the development of meaningful and effective prevention programs. Therefore, the primary objective of the present study was to develop a model of individual and community factors associated with firearm injury prevalence in a sample of incarcerated juvenile offenders. These factors could be utilized to elucidate the causes, consequences, and correlates of violent victimization in a population at extremely high risk for intentional injuries. It was predicted that the overall pattern of offending (e.g., drug trafficking or violent offending) would be an important indicator for determining individual variables associated with firearm injuries, while youth poverty was expected to emerge as an important community

variable associated with firearm injuries in the drug traffickers

METHODS

Subjects

The subject population and data collection have been described previously (McLaughlin, Smith et al 1996). Briefly, data for the study were collected during a retrospective chart review of all juveniles committed to the Commonwealth of Virginia, juvenile correctional centers for drug trafficking offenses (n=266) during fiscal years 1993 and 1994 (1 July 1992 through 30 June 1994). The trafficking offenses included "possession [of controlled substances] with the intent to sell or distribute." Offenses pertaining to the sale, distribution, or manufacture were included; however, offenses relating to the "simple possession [of controlled substances]" were not included as they are presumed to relate to possession for personal use rather than selling (a complete listing of the specific offenses used to construct the groups is available upon request). Because the relationship between drug trafficking and violence has been emphasized recently (Chaiken, Johnson 1988; Dembo, Williams, Wothke, Schmeidler, Getreu, Berry, Wish, Christensen 1990; Goldstein 1985; Goldstein, Brownstein, Ryan, Bellucci 1989; Hamid 1991; Inciardi, Pottieger 1991, 1994; Johnson, Natarajan, Dunlap, Elmoghazy 1994; Li, Feigelman 1994; Stanton, Galbraith 1994), a comparison group of violent juvenile offenders was constructed. The juveniles were classified as violent offenders based on histories of multiple felonious assaults, and the Office of Juvenile Justice and Delinquency Prevention (OJJDP) working definition of violent delinquent offenders (Office of Juvenile Justice and Delinquency Prevention 1993; offense codes and decision rules available upon request). Preliminary analysis with our sample indicated that classification as a "violent" offender correlated highly with several other indices of violence contained within the youth record (unpublished results), as well as the existing literature on violent juvenile offenders (Huizinga, Loeber, Thornberry 1994; Mathias, DeMuro, Allison 1994). These juveniles were matched to the drug traffickers for gender and race.

In an effort to provide a delinquent comparison group representative of the general incarcerated offender population, a second comparison group was generated. Like the

violent offender comparison group described above, the "demographic" comparison group (McLaughlin, Smith et al 1996) also was matched to the drug traffickers for gender and race. In addition, these juveniles were matched to the juvenile drug traffickers on age (15 to 17 years, inclusive) and committing court location. Briefly, the juveniles comprising the demographic comparison group were selected from the communities within the Commonwealth (n=9) responsible for the majority of drug selling commitments. This permitted some control of community variables while allowing the inclusion of juveniles from a variety of geographic locations and economic strata.

The drug trafficker group was almost exclusively male (98%) and African American (96%); and most juveniles were adjudicated for the distribution of cocaine (93%). Preliminary analysis of the records for all juvenile offenders committed during fiscal years 1993 and 1994 (n=2916), indicated that females, non-African Americans and sex offenders were sufficiently different on many of the variables of interest, and their sample sizes prohibitively small in the present study, as to preclude their inclusion in the final analysis. Therefore, to increase the homogeneity of the sample, females, non-African American males, and juveniles with a history of sex offenses were not included in the final analysis. In addition, the records for some of the juveniles were unavailable for review (n=1 and 43 for the drug traffickers and comparison groups, respectively). These subjects were also excluded from the final analysis. Therefore, the final sample sizes for the three groups were 239, 217 and 373 for the drug traffickers, violent offenders, and demographic comparison group, respectively. It should be noted that there was some overlap between the violent offenders and the demographic comparison group (n=83). This was unavoidable as the communities which committed more juvenile drug traffickers also tended to commit more violent offenders, as well. Removing the violent offenders from the demographic comparison group, however, would have resulted in a skewed representation of this population, consequently these juveniles were retained in both groups. In that the demographic comparison group and violent offenders were never compared directly, this overlap was permitted. Therefore, accounting for overlap, the final sample size for all three groups was 746 distinct individuals. Finally, some of the

Table 1: Comparison of Firearm-Injured Juvenile Offenders

	Sample Size	Number Injured		Prior Firearm Injury	Age at Time of Commitment Mean (SEM)		Total Number of Offenses Mean (SEM)		Percentage of Violent Offenders
		#	%						
Total	746	100	13	No	15.9	.04	7.1	.18	31
				Yes	16.0	.11	7.8	.40	34
Juvenile Drug Traffickers	239**	32	13**	No	16.1	.08	5.3	.20	7
				Yes	16.3	.19	6.6	.76	9
Demographic Comparison Group	373**	47	13**	No	16.0	.04	7.4	.23	20
				Yes	16.1	.12	8.2	.52	34
Violent Comparison Group	217	31	14	No	15.4	.08	9.1	.39	0
				Yes	15.8	.20	8.8	.74	100

*Correlated with a prior firearm injury ($p < .05$).

** (McLaughlin, Reiner, et al 1996)

juveniles in each group had been incarcerated more than once during the two fiscal years examined ($n=38$). Delinquency, social and psychological data from all incarcerations of these juveniles were included in the analysis of individual variables; however, information pertaining to overall firearm injury prevalence and the analysis of community variables were based on only the most recent incarceration.

Instruments and Procedures

The youth record included information pertaining to current, prior and pending criminal offenses; social and medical histories; a complete physical examination; a psychological assessment; and measures of intellectual functioning and academic achievement. The medical histories and physicals were completed by trained nurses and physicians, respectively. The social histories were obtained by the case managers. The psychological evaluations were performed by trained psychologists and included a standardized test of intellectual functioning (Wechsler Intelligence Scale for Children - 3rd Edition, [WISC-III]; Wechsler 1991), a mental status interview and projective psychological testing, as needed. Educational information was obtained by educational specialists. All evaluators received extensive and continued training with regard to issues of juvenile offending and high risk behavior. Most of the global decisions regarding overall levels of functioning were made collaboratively at an assessment conference where all evaluators had an opportunity to contribute information. These ratings were frequently composite scores based upon the results of the objective data, test results and clinical impressions compiled during the

evaluation period. It is important to note, however, that the evaluators participating in the assessment process were familiar with the juvenile's offense history. Therefore, the data were interpreted with caution, particularly information which relied on a relatively subjective decision process. Again, many of the subjective decisions were made by the entire evaluation team at the assessment conference. It was hoped, therefore, that any potential individual bias may have been sufficiently attenuated by the multiple sources of converging evidence and consensus ratings at the assessment conference.

Information collected during the assessment phase was then used to complete the "client profile"; a structured survey of the legal, psychological, social, medical and educational data described above. The client profile is routinely completed for every juvenile committed to the Virginia juvenile correctional centers, and contains over 300 data points. These data include multiple lines of converging evidence regarding salient features of the juvenile's history and behavior. Elements of the client profile have been described previously (McLaughlin, Smith et al 1996).

Data associated with the community where the juvenile was arrested and adjudicated, were also analyzed. Because the juveniles in the demographic comparison group had been selected based upon their committing court location, as well as other demographic variables, the analysis of community variables was limited to those communities from which the demographic comparison group had been generated ($n=9$). This resulted in the inclusion of the larger communities in the state, while excluding localities with relatively

Table 2: Stepwise Regression on Firearm Injuries

Variables	b	(beta)	SE b
Aggregate Sample			
Self-reported promiscuity	.12*	(.17)	.02
Dysfunctional current family situation	.04*	(.11)	.01
Constant = .02, Adjusted R squared = .04 (F=17.42, p<.05)			
Juvenile Drug Traffickers			
History of suicidal ideation	.35*	(.19)	.12
Self-reported promiscuity	.12*	(.17)	.04
Judged to be chronically delinquent	.11*	(.15)	.04
Rated level of maturity	.10*	(.15)	.04
Constant = .84, Adjusted R squared = .11 (F=8.60, p<.05)			
Violent Juvenile Offenders			
History of brandishing or possessing a firearm	.15*	(.21)	.04
Self-reported promiscuity	.12*	(.17)	.04
History of suicidal gestures	.23*	(.17)	.09
Poor vocational skills	.05*	(.13)	.02
Constant = .67, Adjusted R squared = .11 (F=7.74, p<.05)			
Demographic Comparison Group			
Self-reported promiscuity	.10*	(.14)	.03
Perceived to be a loner	.14*	(.13)	.05
Dysfunctional family of origin	.04*	(.12)	.02
Reported suicidal gestures	.15*	(.10)	.07
Constant = .29, Adjusted R squared = .05 (F=6.56, p<.05)			

*p<.05

small samples which may have skewed the results. All community information was obtained from databases maintained by the Commonwealth of Virginia, Department of Juvenile Justice (DJJ; formerly known as the Commonwealth of Virginia, Department of Youth and Family Services [DYFS] 1995). The community variables analyzed included youth population and youth poverty rate. Youth population was gathered from 1990 U.S. Census Data and reflects the number of children, birth through 17 years, residing in the community (DYFS 1995). The youth poverty information was obtained from the Virginia Department of Social Services for fiscal years 1991-1992, and represents the average, monthly per capita rate of children living in households receiving aid to dependent children (DYFS 1995). The community data employed in the present study

represented the most current information available at the time of data analysis.

A conservative statistical approach was employed because this study consisted of a retrospective chart review, and conclusive cause-effect relationships could not be determined. The variables were analyzed initially with correlation analysis in an effort to elucidate variables associated with a history of firearm injuries in juvenile offenders (Howell 1992). Most of the variables contained within the youth record were nonparametric in nature; therefore, the statistical analysis employed for evaluation of the individual variables were the Spearman nonparametric, rank-order correlation, and χ^2 . This permitted direct comparison of the injured to the uninjured juveniles for the overall sample, as well as within each category of offending. Odds ratios (95% confidence limits) were employed as descriptive statistics. Multiple linear regression was subsequently employed to evaluate the relative importance of variables found to correlate with the prevalence of a prior firearm injury, such that a model for firearm injuries in juvenile drug traffickers and other juvenile offenders could be developed. Finally, the multiple linear regression was employed for the community data in an effort to determine community factors significantly associated with an increased risk for firearm injuries in juvenile offenders.

RESULTS

Consistent with earlier data (McLaughlin, Reiner et al 1996), the firearm injury prevalence for the violent juvenile offenders was 14 percent. It was interesting to note that, while it was expected that the juvenile drug trafficker group would have included a large number of violent offenders, the demographic comparison group actually overlapped with the violent offender group to a greater degree (Table 1). An examination of all individuals presenting with a prior firearm injury confirmed that self-reported promiscuity was correlated with firearm morbidity prevalence ($r=.17$, $p<.05$; McLaughlin, Reiner et al 1996). We have reported recently that incarcerated juvenile offenders from the Richmond, Virginia metropolitan area with a prior firearm injury were twice as likely to have fathered a child (McLaughlin, Reiner, Reams & Joost under review); providing tangible evidence of the increases in promiscuity associated with firearm injuries. Analysis of the medical records

for offenders from outside Richmond confirmed this finding. Juveniles with a prior firearm injury were more than twice as likely to have fathered a child (odds ratio [95% confidence limits] = 2.6 [1.5 - 4.5]; $\text{Chi}^2 = 13.3$, $p < .05$). In addition, a dysfunctional current family situation was associated with a prior firearm injury ($r = .11$, $p < .05$). These two variables were included in the regression analysis. The results indicated that self-reported promiscuity was somewhat more important than a dysfunctional family in accounting for the overall variance, however, self-reported promiscuity and familial dysfunction together only accounted for 4 percent of the total variance (Table 2). Finally, the average age at the time of commitment is presented in Table 1. The range in age for the injured juveniles was 13-18 years. Although there were no differences between the groups, it is important to note that all of the injuries occurred prior to incarceration. Consequently, the age at which the juveniles sustained the injury would be expected to be somewhat younger.

Juvenile Drug Traffickers

Individual variables associated with a prior firearm injury in the sample of juvenile drug traffickers are listed below. The only relationship consistent with the overall findings described above was a positive association between a prior firearm injury and self-reported promiscuity (McLaughlin, Reiner et al 1996). The injured offenders were correlated with a younger age at first adjudication ($r = -.12$, $p < .05$), and were rated by the assessment team as more chronically delinquent with a poorer prognosis for discontinuing delinquency ($r = .17$ and $.14$, $p < .05$; for chronicity and prognosis, respectively). They were also rated as having impaired short-term memory ($r = .14$, $p < .05$), as well as poor impulse and anger control ($r = .10$ and $.15$, $p < .05$, for impulse and anger control, respectively). In addition, juvenile drug traffickers presenting with a prior firearm injury were rated as less mature ($r = .17$, $p < .05$), and possessing fewer social and interpersonal skills ($r = -.12$, $p < .05$). These juveniles were also more likely to have a documented history of suicidal ideation ($r = .20$, $p < .05$) and gestures (McLaughlin, Reiner et al 1996).

The results of the multiple linear regression indicated that a history of suicidal ideation was slightly more important in determining risk than self-reported promiscuity,

when all of the variables were considered together (Table 2). These two variables were followed by the assessment staff's rating of a chronic delinquency pattern and immaturity. This overall constellation of associated risk factors for the juvenile drug trafficker injuries was somewhat more predictive than that found for the aggregate sample, accounting for approximately 11 percent of the variance.

Violent offenders

Again, the prevalence of a prior firearm injury was positively correlated with self-reported promiscuity in the violent offender group ($r = .19$, $p < .05$). Juveniles with a prior history of a firearm injury were also rated by the assessment team as presenting with deficits in both vocational and employment skills ($r = -.15$ and $-.16$, $p < .05$; for vocational and employment skills, respectively). Moreover, these offenders presented with poor impulse control ($r = .12$, $p < .05$), and were rated as both provocative and aggressive with their peers ($r = .12$ and $.14$, $p < .05$; for provocative and aggressive, respectively). Similar to the injured drug traffickers, the injured violent offenders presented with a documented history of suicidal ideation and gestures ($r = .15$ and $.11$, $p < .05$; for ideation and gestures, respectively). In addition, a prior history of a firearm injury was associated with a history of self-destructive behavior ($r = .13$, $p < .05$), and treatment with antidepressant medication ($r = .13$, $p < .05$). Finally, the injured violent offenders were six times more likely to have a history of brandishing or possessing a weapon (odds ratio [95% confidence limits] = 6.1 [1.8 - 20.8]; $\text{Chi}^2 = 10.5$, $p < .05$), while the injured drug traffickers were less likely to have a history of brandishing or possessing a firearm (McLaughlin, Reiner et al 1996).

The results from the multiple linear regression indicated that a history of possessing or brandishing a firearm was the most important factor in determining a violent juvenile offender's personal risk for a prior firearm injury (Table 2). This was followed by self-reported promiscuity, reported suicidal gestures, and a rating of poor vocational skills. As with the juvenile drug traffickers, the model predicting prior firearm injuries for the violent offenders was better than that developed for the total sample, accounting for approximately 11 percent of the variance.

Table 3: Stepwise Regression on Juvenile Drug Trafficker Firearm Injuries by Community Variables

Variables	b	(beta)	SE b
Total number of youth in the sample committed by a community	.03*	(.64)	.01
Youth poverty rate	.11*	(.44)	.04
Constant = 1.8, Adjusted R squared= .83 (F=21.09, p<.05)			
*p<.05			

Demographic Comparison Group

As before, self-reported promiscuity was significantly associated with the prevalence of a prior firearm injury in the demographic comparison group (McLaughlin, Reiner et al 1996). Resembling the aggregate data, a dysfunctional current family situation was related to a prior firearm injury ($r=.12$, $p<.05$). In addition, a dysfunctional family of origin ($r=.13$, $p<.05$), as well as reported suicidal gestures (McLaughlin, Reiner et al 1996), were also positively related to a prior history of a firearm injury. On the other hand, these offenders were less likely to be judged as being a loner by the assessment team ($r=-.12$, $p<.05$). Finally, the injured juveniles in the demographic comparison group were more likely to present with a higher total number of offenses ($r=.10$, $p<.05$), and more violent offense histories than those who had not been injured ($r=.10$, $p<.05$).

The results of the multiple linear regression indicated that self-reported promiscuity and a tendency to not rate these offenders as loners were most predictive of a prior firearm injury, when all of the variables were considered together (Table 2). These two variables were followed by a dysfunctional current family situation and reported suicidal gestures. As with the aggregate data, however, the overall predictability of these variables was low; accounting for only 5 percent of the variance.

Community Variables

Analysis of the number of firearm injuries in the nine communities analyzed revealed that the overall prevalence of firearm injuries was highly correlated with the number of violent offenders in the sample as well as the total number of offenders in the sample committed by that community ($r=.97$ and $.92$, $p<.05$; for the violent offenders and total number of juvenile offenders committed, respectively). These two variables were highly intercorrelated ($r=.93$, $p<.05$), however, and the number of violent offenders in the sample committed by a community emerged as the

sole predictive variable in the regression analysis; accounting for 94 percent of the overall variance. On the other hand, the number of juvenile drug traffickers injured in a community was strongly associated with the total number of commitments by that community in the sample, as well as the level of youth poverty ($r=.85$ and $.75$, $p<.05$; for the total number of offenders committed and youth poverty rate, respectively). The results of the regression analysis indicated that these two factors together accounted for 83 percent of the overall variance (Table 3).

CONCLUSIONS

It was hypothesized that the pattern of offending would be an important variable in determining the factors associated with an increased risk for a prior firearm injury in juvenile offenders. Multiple linear regression was employed in an effort to evaluate the relative importance of variables associated with the prevalence of a prior firearm injury, and to begin an initial attempt to elucidate putative associated risk factors for firearm injuries in juvenile offenders. The results of the regression analysis indicated that while single variables do not possess much predictive utility, composites of several, empirically-related factors may hold more promise for future study. These risk factors appeared to differ, however, depending upon the juvenile's pattern of offending (e.g., drug trafficking, violent offenders), supporting the hypothesis that the pattern of offending is important in determining the particular factors associated with firearm injuries in juvenile offenders.

Individual Variables Associated with Firearm Injuries

When the aggregate data were analyzed only two variables, self-reported promiscuity and familial dysfunction, correlated with the prevalence of a prior firearm injury. The percentage of the overall variance accounted for by these two variables was small, however. Consistent with recent reports (May et al 1995;

McLaughlin, Reiner et al 1996), weapon possession did not correlate with the prevalence of firearm injuries in the aggregate sample, though the diametrically opposed correlations noted in the drug traffickers and violent offenders would have confounded the observation of any overall relationship. Similarly, few variables were associated with an increased prevalence of a prior firearm injury in the demographic comparison group. Again, this group was not generated based upon a specific pattern of offending and, like the aggregate data, was collapsed across offender categories.

The only variable to reliably correlate with an increased prevalence of firearm injury across all groups was self-reported promiscuity. This was consistent with earlier reports which noted an association between firearm injuries, promiscuity, sexually transmitted disease, and becoming an adolescent parent (May et al 1995; Schubiner, Scott, Tzelepis 1993; McLaughlin, Reiner et al 1996; McLaughlin, Reiner, under review). Subsequent grouping of the subjects by their pattern of offending revealed additional individual variables which were associated with the prevalence of a prior firearm injury.

The injured juvenile drug traffickers were judged as relatively dysfunctional when compared to their uninjured drug selling peers, presenting as immature and having poor social and interpersonal skills, with deficits in short-term memory. It has been suggested that individuals not functioning efficiently within the drug distribution network may become a poor business risk and are consequently at an increased risk for violent victimization (Goldstein 1985; Goldstein et al 1989). These juveniles also were less likely to have a history of possessing a weapon which may have placed them at greater risk for violence within the drug distribution arena; possibly reflecting poor defensive skills. On the other hand, the injured violent offenders presented as being at the extreme end of the aggression/violence continuum. The injuries sustained by this sample may have been a consequence of the predatory nature of their pattern of offending, however it is also possible that the aggressivity noted in this group may have been a response to violent victimization.

Community Variables Associated With Firearm Injuries

The data from the present study indicated that community factors were strongly

associated with firearm injury prevalence. The community variable most related to an increased prevalence of firearm injuries in the aggregate sample was the number of violent offenders in the sample committed to the juvenile correctional centers by that community. This variable was highly related to firearm injury prevalence, accounting for 94 percent of the overall variance, and may be viewed as a crude reflection of the level of community violence. Closer examination of the juvenile drug traffickers, however, revealed that the total number of juveniles in the sample committed by a community and the youth poverty rate, not community violence, were the key variables. The association between youth poverty and firearm injuries in the drug traffickers was anticipated, and is consistent with the suggestion that robbery or other economic gain may be a motivator in some of the violence directed at those involved in drug selling (Goldstein 1985; Goldstein et al 1989). Again, the pattern of offending provided additional insight into risk, further underscoring the complex interaction between juvenile offending and firearm injuries. Finally, the level of community urbanization has been cited as a risk factor for violent victimization (Earls 1994; Fingerhut, Ingram, Feldman 1992a), however youth population was not found to be associated with an increased prevalence of firearm morbidity in the present study ($p > .05$). This variable was not intentionally manipulated, however, and most of the communities evaluated represented the larger urban areas within the Commonwealth of Virginia.

To integrate the individual, community and offender-specific data; the findings in the present study indicate that the pattern of offending must be considered when attempting to elucidate variables associated with a risk for firearm injury. In addition, the results are consistent with the hypothesis that the juvenile drug traffickers may have been injured as a result of a general inability to adequately judge dangerous situations, perhaps a situation where they may be at increased risk for robbery or other victimization, or function effectively within the drug trafficking arena. Conversely, the injured violent offenders may have precipitated a violent attack through their violent interactional style, or the predatory nature of their offending; concomitantly increasing the overall prevalence of juvenile offender firearm injuries in a community.

Comment

Due to the nature of the present data, it was not possible to distinguish among the causes, consequences, and correlates of firearm injuries. The behaviors associated with firearm injuries may have increased the risk of victimization, or, conversely, these variables may have been the result of the violent victimization. It is also possible that the associated behaviors may have been related to a common underlying factor and, consequently, merely correlated with the injury. For example, it is unlikely that a lack of employment skills was either causally or consequentially related to a violent offender's risk of firearm injury. Rather, this deficit probably reflected other risk factors present in the juvenile, including a history of multiple felonious assaults, incarceration and involvement with weapons; both of which would be expected to impact upon the juvenile's ability to secure and maintain employment. Consequently, the rated lack of employment skills may have been simply correlated with a prior firearm injury. Although the data from the present study were correlative, they were consistent with two of the hypothesized outcomes: illuminating different profiles of variables associated with firearm injuries in juvenile offenders, and supporting the idea of a constellation of individual and community risk factors which are directly related to the specific pattern of offending.

It is also important to remember that all of the relationships described above are relative. For example, although the injured drug traffickers presented as more dysfunctional than the uninjured drug traffickers, they were still rated as higher functioning in several domains than either the demographic or violent comparison groups (data not shown). Again, this exemplifies the role that the pattern of offending may play in characterizing these juveniles. In addition, the subjects in the present study were all incarcerated juvenile offenders, possibly representing the "unsuccessful" offenders. We have recently reported that increased penetration into the juvenile justice system is directly related to an increased prevalence of firearm injuries. Consequently it is possible that this "unsuccessful" attribute may be related to incarceration as well as the high prevalence of firearm injuries observed in all three groups. This point also serves to highlight the importance of using delinquent comparison groups in research of this type. For example, a firearm injury prevalence of 13

percent for juvenile drug traffickers is relatively high when compared to national data for adolescents (Reiss, Roth 1993), but was not found to significantly diverge from the rate documented in the other samples of juvenile offenders (McLaughlin, Reiner et al 1996). Finally, all of the juveniles examined in the present study were African American male adolescents, a group noteworthy for their risk of firearm mortality and morbidity (Bastian, Taylor 1994; Fingerhut, Ingram, Feldman, 1992a, 1992b; Fingerhut, Kleinman 1990; Tardiff, Marzuk, Leon, Hirsch, Stajic, Portera, Hartwell 1994; US Department of Justice 1994). This point should not serve to diminish the fact, however, that we have identified a category of adolescents at extreme risk for firearm injuries, far exceeding the elevated baseline already noted for this population, and that involvement in juvenile offending appears to substantially escalate this increased risk for violent victimization.

Finally, the explanations for the data described above are hypotheses which should be tested empirically with future samples such that models for specific, causal risk factors and the resulting sequelae can be developed. Data indicating a high rate of recurrence and ultimate mortality for victims of violent crime (Sims, Bivins, Obeid, Horst, Sorensen, Fath 1989) predict that injured juvenile offenders are at even greater risk for future injuries and/or firearm mortality; serving to highlight the importance of identifying potential risk factors. The results from the present study may represent an empirically-generated "short list" of risk factors to be evaluated further with future samples of juvenile offenders. The results indicate that the key risk factors and associated sequelae may be dependent upon the pattern of offending; possibly yielding a mechanism by which the underlying causes may be elucidated and defined. The causal determinants and resulting consequences of violent victimization identified could then be employed in the development of more effective and specifically-targeted violence prevention programming, as well as support services for the victims of violent crime. In conclusion, the results from the present study have significant implications for any prevention effort; suggesting that a complex interaction between the pattern of offending, and individual as well as community variables all serve to define the overall risk for firearm injuries in juvenile offenders.

ACKNOWLEDGMENTS

An abbreviated version of these findings has been published previously as a letter to the editor in the *American Journal of Public Health* May 1996 Volume 86

This work was supported by the National Institute on Drug Abuse at the National Institutes of Health (DA10000).

REFERENCES

- Armfield F 1994 Preventing post-traumatic stress disorder resulting from military operations *Military Medicine* 159 739-746
- Bastian LD, Taylor BM 1994 *National Crime Victimization Survey: Young Black Male Victims* Bureau of Justice Statistics NCJ-147004
- Chaiken MR, BD Johnson 1988 *Characteristics of Different Types of Drug-Involved Offenders* National Institute of Justice NCJ-108560
- Dembo R, L Williams, W Wothke, J Schmeidler, A Getreu, E Berry, ED Wish, & C Christensen 1990 The relationship between cocaine use, drug sales, and other delinquency among a cohort of high-risk youths overtime. In M De La Rosa, EY Lambert, B Groppereds *Drugs and Violence: Causes, Correlates, and Consequences* NIDA Research Monograph Rockville, MD: National Institute on Drug Abuse
- Department of Youth and Family Services, Commonwealth of Virginia 1995 *High Risk Indicator Report for FY 91-92*
- Earls FJ 1994 Violence and today's youth *Future of Children: Critical Health Issues for Children Youth* 4 4-23
- Elliot DS, D Huizinga, SS Ageton 1985 *Explaining Delinquency and Drug Use* Beverly Hills, CA: Sage
- Farrow JA 1991 Health Issues among Juvenile Delinquents pp 21-33 in LS Thompson ed *The Forgotten Child in Health Care: Children in the Juvenile Justice System* Washington, DC: National Center for Education in Maternal and Child Health
- Fingerhut LA, DD Ingram, JJ Feldman 1992a Firearm and nonfirearm homicide among persons 15 through 19 years of age: differences by level of urbanization, United States, 1979 through 1989 *JAMA* 267 3048-3053
- _____ 1992b Firearm homicide among black teenage males in metropolitan counties: comparison of death rates in two periods, 1983 through 1985 and 1987 through 1989 *JAMA* 267 3054-3058
- Fingerhut LA, JC Kleinman 1990 International and interstate comparisons of homicide among young males *JAMA* 263 3292-3295
- Goldstein PJ 1985 The drugs/violence nexus: a tripartite conceptual framework *J Drug Issues* 15 493-506
- Goldstein PJ, HH Brownstein, PJ Ryan, PA Bellucci 1989 Crack and homicide in New York City, 1988: a conceptually based event analysis *Contemp Drug Problems* 16 651-658
- Hamid A 1991 Crack. New directions in drug research. Part 2. Factors determining the current functioning of the crack economy - a program for ethnographic research *Internat J Addictions* 26 913-922
- Howell DC 1992 *Statistical Methods For Psychology* Belmont, CA: Duxbury Press
- Huizinga D, R Loeber, TP Thornberry 1994 *Urban Delinquency and Substance Abuse: Initial Findings* Rockville, MD: Juvenile Justice Clearinghouse
- Inciardi JA, AE Pottierger 1991 Kids, crack, and crime *J Drug Issues* 21 257-270
- _____ 1994 Crack-cocaine use and street crime *J Drug Issues* 24 273-292
- Johnson BD, M Natarajan, E Dunlap, E Elmoghazy 1994 Crack abusers and noncrack abusers: profiles of drug use, drug sales and nondrug criminality *J Drug Issues* 24 117-141
- Li X, S Feigelman 1994 Recent and intended drug trafficking among male and female urban African-American early adolescents *Pediatrics* 93 1044-1049
- Mathias RA, P DeMuro, RS Allison 1994 *Violent Juvenile Offenders: An Anthology* San Francisco, CA: National Council on Crime and Delinquency
- May JP, MG Ferguson, R Ferguson, K Cronin 1995 Prior nonfatal firearm injuries in detainees of a large urban jail *J Health Care for Poor Underserved* 6 162-176
- McLaughlin CR, J Daniel, SM Reiner, DE Waite, PN Reams, TF Joost, JL Anderson, AS Gervin Under review. Factors associated with assault-related firearm injuries in male adolescents.
- McLaughlin CR, SM Reiner, PN Reams, TF Joost Under review. Intentional injury and adolescent parenting among incarcerated juvenile offenders.
- McLaughlin CR, SM Reiner, BW Smith, DE Waite, PN Reams, TF Joost, AS Gervin 1996 Firearm injuries among juvenile drug traffickers (Letter) *American J Public Health* 86 751-752
- McLaughlin CR, BM Smith, SM Reiner, DE Waite, AW Glover 1996 Juvenile drug traffickers: characterization and substance use patterns *Free Inq Creat Sociol* 24 1 3-10
- Office of Juvenile Justice and Delinquency Prevention 1993 *Comprehensive Strategy For Serious, Violent, and Chronic Juvenile Offenders* Rockville, MD: Juvenile Justice Clearinghouse
- Reiss AJ, JA Roth 1993 *Understanding and Preventing Violence* Washington, DC: National Academy Press
- Schubiner H, R Scott, A Tzelepis 1993 Exposure to violence among inner-city youth *J Adolescent Health* 14 214-219
- Sims DW, BA Bivins, FN Obeid, HM Horst, VJ Sorensen, JJ Fath 1989 Urban trauma: a chronic recurrent disease *J Trauma* 29 940-947
- Stanton B, J Galbraith 1994 Drug trafficking among African-American early adolescents: prevalence, consequences, and associated behaviors and beliefs *Pediatrics* 93 1039-1043
- Tardiff K, PM Marzuk, AC Leon, CS Hirsch, M Stajic, L Portera, N Hartwell 1994 Homicide in New York City: cocaine use and firearms *JAMA* 272 43-46
- US Department of Justice 1994 *Firearms and Crimes of Violence: Selected Findings from National Statistical Series* Bureau of Justice Statistics NCJ-146844
- Wechsler D 1991 *Wechsler Intelligence Scale for Children* NY: Psychological Corporation