

Posttraumatic Stress Disorder in Abused and Neglected Children Grown Up

Cathy Spatz Widom, Ph.D.

Objective: The purpose of this study was to describe the extent to which childhood abuse and neglect increase a person's risk for subsequent posttraumatic stress disorder (PTSD) and to determine whether the relationship to PTSD persists despite controls for family, individual, and lifestyle characteristics associated with both childhood victimization and PTSD. **Method:** Victims of substantiated child abuse and neglect from 1967 to 1971 in a Midwestern metropolitan county area were matched on the basis of age, race, sex, and approximate family socioeconomic class with a group of nonabused and nonneglected children and followed prospectively into young adulthood. Subjects (N=1,196) were located and administered a 2-hour interview that included the National Institute of Mental Health Diagnostic Interview Schedule to assess PTSD. **Results:** Childhood victimization was associated with increased risk for lifetime and current PTSD. Slightly more than a third of the childhood victims of sexual abuse (37.5%), 32.7% of those physically abused, and 30.6% of victims of childhood neglect met DSM-III-R criteria for lifetime PTSD. The relationship between childhood victimization and number of PTSD symptoms persisted despite the introduction of covariates associated with risk for both. **Conclusions:** Victims of child abuse (sexual and physical) and neglect are at increased risk for developing PTSD, but childhood victimization is not a sufficient condition. Family, individual, and lifestyle variables also place individuals at risk and contribute to the symptoms of PTSD.

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An increasing literature has implicated childhood victimization (particularly physical and sexual abuse) in the etiology of posttraumatic stress disorder (PTSD) (1-3). Studies of physically or sexually abused children have also reported high rates of PTSD (4-7).

At present, three general types of empirical studies relate childhood trauma to PTSD: 1) relatively short-term assessments of clinically referred, in treatment, or psychiatrically hospitalized sexually or physically abused children; 2) studies of adult survivors (victims) or adults with PTSD; and 3) cross-sectional studies reporting the extent of PTSD in community samples of adolescents or adults that retrospectively

obtain information about prior childhood victimization. Most studies focus on the impact of sexual abuse (8-11) and often involve female hospital patients (12, 13). It is of interest that not all studies report significant relationships between childhood victimization and PTSD (14-16).

Besides the obvious explanation that childhood victimization experiences represent the traumas from which posttraumatic stress symptoms develop, there are other possible explanations for the relationship between childhood maltreatment and PTSD. For example, one question is whether child abuse and neglect represent part of a constellation of disadvantage and dysfunctional behaviors that are pathogenic. Since much childhood victimization occurs in the context of multiproblem homes, child abuse and neglect may be only one of the family's problems. Childhood abuse and neglect may be markers for other factors that have an impact on the developing child or may share with PTSD a common origin in a disrupted and disorganized childhood. Thus, the general effects of other family variables (such as poverty, parental alcoholism or drug problems, or other inadequate social and family func-

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tioning) need to be disentangled from specific sequelae associated with childhood abuse or neglect (17).

A second concern is that previous research has suggested that abused and neglected children are at increased risk for early behavior problems and conduct disorder (18–20). Behavior problems in childhood or adolescence may be associated with increased risk for engaging in risky behaviors. In turn, such behaviors may lead to increased risk of exposure to traumatic events and to subsequent PTSD (21).

A third possibility is that childhood victimization may be associated with PTSD through its effect on a person's lifestyle, which places the person more or less at risk for exposure to traumatic events and, ultimately, PTSD. For example, Breslau et al. (22) have identified a set of risk factors for PTSD, such as low levels of education and extroversion, that serve to expose individuals to social roles and environments associated with high risk for victimization.

The present examination of PTSD is part of a prospective study of the long-term consequences of early childhood victimization (23, 24) that used documented and substantiated cases. Thus, it offers an opportunity to determine whether PTSD is one of the sequelae of early childhood maltreatment (physical and sexual abuse and neglect). This article presents findings from a cohorts design study in which abused and neglected children were followed up into adulthood and compared to a matched group. The aims of this study were threefold: 1) to determine whether individuals who experienced abuse and/or neglect as young children are more likely to be diagnosed with PTSD as adults than individuals in a matched comparison group, 2) to examine the prevalence of exposure to specific types of traumatic events, and 3) to determine the extent to which the linkage between childhood abuse and neglect and PTSD is a function of other risk factors often associated with childhood victimization. Since family, individual child, and lifestyle risk factors have been associated with increased risk for PTSD, the purpose of the third goal is to test the hypothesis that the relationship between childhood victimization and PTSD will persist even when the contributions of family, individual child, and lifestyle risk factors are controlled.

METHOD

Subjects

The data for the present article are from a large research project based on a prospective cohorts design study (25, 26). Abused and/or neglected children were matched with nonvictimized children and followed prospectively into young adulthood. The prospective nature of this study allows some issues of causality to be examined and helps to disentangle the effects of childhood victimization from other potentially confounding effects. Because of the matching procedure, the subjects are assumed to differ in the risk factor (that is, having experienced childhood sexual or physical abuse and/or neglect). Since it is not possible to randomly assign subjects to groups (and obviously, this could not be done), the assumption of equivalency for

the groups is an approximation. For complete details of the study design and subject selection criteria, see Widom (27).

In the first phase of this research, a large group of children who were abused and/or neglected approximately 20 years earlier were followed up through an examination of official criminal records and compared with a matched group of children (28). The abused and/or neglected group was composed of victims of substantiated childhood physical and sexual abuse and/or neglect whose cases were processed during the years 1967 through 1971 in the county juvenile or adult criminal court (situated in a metropolitan area in the Midwest). These are cases of early child abuse and/or neglect, restricted to children who were 11 years of age or less at the time of the abuse or neglect incident.

Physical abuse cases included injuries such as bruises, welts, burns, abrasions, lacerations, wounds, cuts, bone and skull fractures, and other evidence of physical injury. Sexual abuse cases varied from those involving relatively nonspecific charges of "assault and battery with intent to gratify sexual desires" to more specific ones of "fondling or touching in an obscene manner," sodomy, incest, and so forth. Neglect cases reflected a judgment that the parents' deficiencies in child care were beyond those found acceptable by community and professional standards at the time. These cases represented extreme failure to provide adequate food, clothing, shelter, and medical attention to children.

A matched comparison group was established. Children who were under school age at the time of the abuse and/or neglect incident were matched with children of the same sex, race, date of birth (within 1 week), and hospital of birth through the use of county birth records. For children of school age, records of more than 100 elementary schools for the same time period were used to find matches with children of the same sex, race, date of birth (within 6 months), same class in same elementary school during the years 1967 through 1971, and home address. Overall, there were matches for 74% of the abused and neglected children.

The second phase of the research involved the tracing, locating, and interviewing of the abused and/or neglected individuals (20 years after their childhood victimization) and comparison subjects. Two-hour follow-up interviews were conducted between 1989 and 1995. The interview consisted of a series of structured and semistructured questions and rating scales, measures of IQ and reading ability, and a psychiatric assessment.

Interviewers were blind to the purpose of the study, to the inclusion of an abused and/or neglected group, and to the participants' group membership. Similarly, the subjects were blind to the purpose of the study. Subjects were told that they had been selected to participate as part of a large group of individuals who grew up in the late 1960s and early 1970s. Subjects who participated signed a consent form acknowledging that they were participating voluntarily.

Of the original group of 1,575, 1,307 subjects (83%) have been located and 1,196 (76%) interviewed. Of the people not interviewed, 43 were deceased (before interview), eight were incapable of being interviewed, 268 were not found, and 60 refused to participate (a refusal rate of 3.8%). The findings reported here are based on 1,196 subjects (676 abused and/or neglected and 520 comparison subjects).

Comparison of the current follow-up group with the original group indicated no significant differences in terms of percent male, white, abused and/or neglected, poverty in childhood census tract, or mean current age. The interviewed group (follow-up group) was significantly more likely to have an official criminal arrest record than the original group; $z=3.9$, $p<0.01$. However, this is not surprising, since people with a criminal history are generally easier to find, in part because they have more "institutional footprints" to assist in locating them.

Approximately half the group (48.7%) were women, and about two-thirds (62.9%) were white. At the time of interview, the average age of the participants was 28.72 years ($SD=3.84$, range=18–40). There were no differences between the abused and neglected group and comparison subjects in terms of gender, race/ethnicity, or age. The average highest grade of school completed for the group was 11.47 ($SD=2.19$, range=5–26). The group is skewed toward the

TABLE 1. Prevalence of DSM-III-R PTSD in Abused and Neglected Children Grown Up and Matched Comparison Subjects^a

Group	N	Lifetime PTSD				Current PTSD			
		Subjects		Odds Ratio	95% CI	Subjects		Odds Ratio	95% CI
		N	%			N	%		
Comparison	520	106	20.4			54	10.4		
Abuse or neglect ^b	676	209	30.9***	1.75	1.3–2.3	120	17.8***	1.86	1.3–2.6
Physical abuse	110	36	32.7**	1.90	1.2–3.0	21	19.1*	2.04	1.2–3.5
Sexual abuse	96	36	37.5***	2.34	1.5–3.7	22	22.9***	2.57	1.5–4.5
Neglect	543	166	30.6***	1.72	1.3–2.3	94	17.3***	1.81	1.3–2.6

^a Statistical comparisons (chi-square analyses) are between the childhood victim group and the comparison subjects.

^b The numbers of cases of specific types of abuse and neglect do not add up to the total in the abuse/neglect group (N=676) because some individuals experienced more than one type of abuse or neglect.

* p<0.05. ** p<0.01. *** p<0.001.

lower end of the socioeconomic spectrum. The median occupational level (29) for the group was semiskilled workers, and less than 7% were in levels 7–9 (managers through professionals).

Diagnostic Assessment

The National Institute of Mental Health Diagnostic Interview Schedule (DIS) (30) was used to assess PTSD. The DIS section on PTSD begins with a question in which several typical PTSD events are mentioned and respondents are asked whether any of these events has ever happened to them. The description of traumatic events follows closely the DSM-III-R text and uses examples from that definition. A report of an event that does not fit the stressor definition (e.g., illness, divorce) is excluded from further inquiry, and the respondent is asked whether he or she has experienced another event of the sort described in the question. A respondent's report of a PTSD-type event is followed by questions about the occurrence of PTSD symptoms after the event. Up to three qualifying events are investigated as to their PTSD sequelae. "Lifetime" prevalence is the proportion of the group who ever experienced PTSD, and "current" refers to the proportion who experienced PTSD sometime within 12 months before the interview. An earlier version of the DIS PTSD module was reported to have acceptable reliability (31) and construct validity (32). In a group of psychiatric inpatient veterans, Breslau and Davis (31) reported fairly strong interjudge agreement (laypersons and psychiatrists) for subjects who did and did not receive diagnoses of PTSD.

Statistical Analyses

Categorical variables were tested for significance with chi-square analyses and, when appropriate, Fisher's exact tests. Odds ratios (and 95% confidence intervals [CIs]) are reported for univariate analyses. Logistic regression is an appropriate statistical technique for examining the effects of a predictor variable on a dichotomous dependent variable (e.g., PTSD diagnosis). Ordinary least squares regression analysis was used to estimate the adjusted risk for the number of lifetime PTSD symptoms; family, individual child, and lifestyle risk factors were controlled. The number of subjects varied slightly in each analysis because of missing data. Statistical significance was set at 0.05.

RESULTS

Childhood Abuse and Neglect and PTSD

Lifetime and current prevalence rates for DSM-III-R PTSD are presented in table 1 for the abused and neglected group as a whole, separately for individuals who experienced physical abuse, sexual abuse, or neglect, and for comparison subjects. As a group, significantly more of those who had been abused or neglected in childhood met the criteria for lifetime and

current PTSD than those in the comparison group. The odds of an abused and neglected child developing PTSD were 1.75 times higher than the odds for a matched comparison subject. Increased risk for lifetime PTSD was also manifest for subjects who experienced the three specific types of abuse and neglect: any physical abuse (odds ratio=1.90), any sexual abuse (odds ratio=2.34), and any neglect (odds ratio=1.72). (Since abused and neglected children may have experienced more than one form of abuse or neglect, these categories are not mutually exclusive, and the numbers reflecting the individual types of abuse and neglect do not add up to the total number of abused and neglected children.) As adults, abused and neglected children are also at increased risk for current PTSD. For the purposes of this article, however, subsequent results are reported for lifetime PTSD only.

Exposure to Traumatic Events

These results have shown that childhood victimization increases a person's risk for PTSD. A critical question is whether the qualifying event that was the basis for the development of PTSD was the original documented case of child abuse or neglect or a subsequent event or events. Table 2 displays the prevalence of exposure to specific types of traumatic events. Of the people who reported exposure to any traumatic event, 55.7% (N=397) reported one event, 26.2% (N=187) reported two events, and 18.1% (N=129) reported three events. Of these, almost half the abused and neglected children (48.9%, N=211) reported exposure to two or more qualifying events, in contrast to 37.3% (N=105) of the comparison subjects. Victims of childhood sexual abuse (74.0%, N=71) and physical abuse (71.8%, N=79) reported the highest rates of exposure to traumatic events, although neglected children also reported significantly higher rates of exposure (62.8%, N=341) than comparison subjects (54.0%, N=281). Overall, the most common traumatic events were seeing someone hurt or killed (16.6%, N=198), physical assault (12.6%, N=151), and rape (12.0%, N=143). However, the distribution of exposure to traumatic events differed for childhood victims and comparison subjects and across types of childhood victimization. It is of interest that victims of all three specific types of

TABLE 2. Prevalence of Exposure to Specific Types of Traumatic Events for Abused and Neglected Children Grown Up and Matched Comparison Subjects^a

Traumatic Event	Percent of Subjects					
	Overall (N=1,196)	Comparison (N=520)	Abuse or Neglect (N=676)	Type of Abuse or Neglect ^b		
				Physical Abuse (N=110)	Sexual Abuse (N=96)	Neglect (N=543)
Seeing someone hurt or killed	16.6	15.8	17.2	16.4	17.7	16.8
Physical assault	12.6	10.2	14.5*	16.4	13.5	14.9*
Rape	12.0	6.4	16.3***	21.8***	29.2***	15.1***
Sudden injury or accident	11.5	10.0	12.6	17.3*	13.5	11.4
Threat	9.6	9.2	9.9	10.9	15.6	8.8
News of sudden death or accident	8.9	8.9	9.0	6.4	8.3	9.8
Other event	6.4	4.8	7.7*	12.7**	11.5*	7.0
Disaster	4.0	3.7	4.3	3.6	2.1	4.8
Narrow escape	3.6	4.2	3.1	4.6	4.2	3.1
Seeing another's experience	1.8	1.5	1.9	0.0	4.2	1.8
Military combat	0.8	1.0	0.6	0.9	0.0	0.7
Any qualifying event	59.6	54.0	63.9***	71.8***	74.0***	62.8**

^a Statistical comparisons (chi-square analyses) are between the childhood victim group and the comparison subjects.

^b The numbers of cases of specific types of abuse and neglect do not add up to the total in the abuse/neglect group (N=676) because some individuals experienced more than one type of abuse and neglect.

* $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

abuse (physical and sexual abuse and neglect) reported significantly higher lifetime exposure to rape than comparison subjects.

Table 2 does not show the extent of qualifying events that were reported to occur in childhood (that is, during the period in which these abuse and neglect cases were processed and documented); however, these analyses were performed, and details are available from the author. Briefly, only 36.4% (N=40) of those physically abused and 35.4% (N=34) of those sexually abused reported a qualifying event in childhood (before age 13), in contrast to less than a quarter of the neglected children (22.7%, N=123) and 10.4% (N=54) of the comparison subjects. The most frequent traumatic event reported to have occurred before age 13 was rape, and this was reported by 9.0% (N=61) of the abuse and neglect group overall, 20.8% (N=20) of those sexually abused, 15.5% (N=17) of those physically abused, and 7.6% (N=41) of those neglected), in contrast to less than 1.9% (N=10) of the comparison subjects.

Factors Associated With Childhood Victimization

Abused and neglected children may also be at increased risk for PTSD because of factors other than exposure to childhood victimization, since abuse and/or neglect in childhood is often associated with increased risk for family, individual child, and lifestyle risk factors. Indeed, abused and neglected children were significantly more likely to come from families with problems (having parents who had been arrested [odds ratio=2.4] or had alcohol or drug problems [odds ratio=2.3]), families who had received welfare during the subject's childhood (odds ratio=2.7), or large families (five or more children; odds ratio=2.2). Childhood victims were also more likely to have had early behavior problems (odds ratio=1.9) and to engage in lifestyles characterized by marital disruption (separated, divorced, or widowed; odds ratio=1.8), low levels of edu-

cation (less than a college degree; odds ratio=4.7), and substance abuse problems (DSM-III-R diagnosis of either alcohol or drug abuse/dependence; odds ratio=1.3). Further analyses revealed that these family, individual, and lifestyle factors were also independently associated with increased risk for PTSD. Interactions between childhood victimization and each factor were tested; none was significant in predicting PTSD.

Adjustment of Risk for PTSD

To begin to disentangle the effects of childhood victimization from these other characteristics, the next set of analyses focused on the extent to which the association between childhood victimization and PTSD might be due to the effects of family, individual child, or lifestyle characteristics. Here, the effect of childhood victimization (abuse/neglect) as a predictor of PTSD was assessed; the other factors were controlled. The critical prediction is that if there is an independent effect of childhood victimization, then childhood abuse/neglect should remain a significant predictor of PTSD symptoms despite the introduction of covariates. Two types of analyses were undertaken: a logistic regression predicting lifetime PTSD diagnosis and an ordinary least squares regression predicting the number of lifetime PTSD symptoms.

The first part of table 3 shows the adjusted risk of child abuse and neglect as a predictor of lifetime PTSD diagnosis with eight covariates. It is striking that the significance of the childhood victimization variable disappears in this adjusted model (compare with table 1). Significant predictors of lifetime PTSD diagnosis were behavior problems, marital disruption, and an alcohol/drug diagnosis. The variable of less than a college degree approached significance as a predictor but did not reach customary levels, suggesting that among these individuals, having a college degree may be important in lowering risk for PTSD.

TABLE 3. Adjusted Risk for Lifetime PTSD Diagnosis and Symptoms in Abused and Neglected Children Grown Up (N=676) and Matched Comparison Subjects (N=520)

Variable	Logistic Regression: PTSD Diagnosis			Ordinary Least-Squares Regression: PTSD Symptoms	
	Parameter Estimate	Odds Ratio	95% CI	Parameter Estimate	SE
Intercept	-3.09			0.48	1.23
Abuse or neglect	0.23	1.26	0.94-1.68	2.06***	0.58
Parent arrested	0.29	1.34	1.00-1.81	1.48*	0.61
Parent had drug problems	0.22	1.24	0.92-1.67	1.61**	0.60
Parent on welfare	0.16	1.18	0.89-1.56	0.24	0.57
Large family (five or more children)	0.28	1.33	0.97-1.81	0.49	0.60
Behavior problems (three or more before age 15)	0.33	1.39*	1.04-1.85	2.36***	0.58
Separated, divorced, or widowed	0.50	1.65**	1.17-2.33	1.70*	0.75
Less than a college degree	0.82	2.27	0.94-5.45	1.30	1.24
DSM-III-R diagnosis of alcohol or drug abuse or dependence	0.54	1.72***	1.27-2.33	1.89**	0.58

* $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

The second set of results in table 3 shows the effect of child abuse/neglect and the eight covariates on the number of PTSD symptoms. Overall, this model explains about 9% of the variation. In the ordinary least squares analysis predicting PTSD symptoms, childhood abuse/neglect remained significant despite the introduction of family, individual child, and lifestyle risk factors. On average, in the adjusted model, abuse/neglect was associated with an increase of two PTSD symptoms, holding constant the other risk factors and control variables. The following five additional covariates were significant at the <0.05 level: having a parent who was arrested or had alcohol or drug problems, having early behavior problems, having experienced marital disruption (separated, divorced, or widowed), and having a DSM-III-R diagnosis of alcohol or drug abuse/dependence. These findings suggest that certain types of environments (having criminal parents) may be especially conducive to development of subsequent PTSD symptoms, perhaps through exposure to traumatic events (22). In contrast, these results indicate that growing up in homes characterized by poverty (parents receiving welfare payments) or in a large family does not appear to be associated with increased risk for PTSD.

One final ordinary least squares regression was performed by using the specific types of childhood victimization (any physical abuse, any sexual abuse, and any neglect) plus the eight covariates to predict the number of lifetime PTSD symptoms. Sexual abuse remained highly significant ($p < 0.001$) in predicting PTSD symptoms, whereas physical abuse ($p = 0.05$) and neglect ($p = 0.07$) were only marginally significant.

DISCUSSION

This prospective cohorts design study has documented a significant increase in risk for PTSD for abused and neglected children who were followed up into young adulthood, in contrast to a matched comparison group. The increase in risk for PTSD was found not only in physically abused or sexually

abused children, but also in those neglected. Furthermore, childhood experiences of abuse and neglect also contributed independently to a person's risk of PTSD, even when known risk factors were controlled. Unexpectedly, childhood abuse/neglect did not remain significant in the adjusted equations predicting PTSD diagnosis, whereas childhood victimization remained significant in predicting the number of PTSD symptoms. No simple explanation presents itself for these provocative findings, except that the continuous measure of PTSD symptoms provided a more fine-grained and sensitive analysis of these relationships than the dichotomous measure (diagnosis). However, one implication of these findings is whether it would be of value to reconsider the threshold for making a diagnosis of PTSD.

Abused and neglected children often come from multiple-problem families, and these results reinforce the need to begin to disentangle consequences specifically associated with childhood victimization from other risk factors. Other forms of family dysfunction (33, 34), environmental vulnerability through exposure to events and people (22), and genetic vulnerability (35) may contribute substantially to increased risk for PTSD.

These findings are consistent with some previous studies. For example, Boney-McCoy and Finkelhor (36) found increased PTSD-related symptoms in abused adolescents, even after control for parent-child relationships. Boney-McCoy and Finkelhor found that prior psychopathology related to the emergence of PTSD but not parent-child relationship problems. It is of interest that the current results indicate that childhood behavior problems (an indicator of prior psychopathology) were a significant and robust risk factor for the development of PTSD (both diagnosis and symptoms).

One especially noteworthy finding was that neglected children were also at increased risk for PTSD. Perhaps because their injuries are not as immediately apparent as in physical or sexual abuse, neglected children may be overlooked in the provision of mental

health treatment services. However, neglected children represent the largest component of official cases of child maltreatment confronting our child protective service systems today (37). Assuming that these trends continue, neglected children will also represent a substantial group of individuals manifesting PTSD in the future. Given that neglected children are also at increased risk for violent criminal behavior (24, 28), multiple pathways to PTSD are likely and warrant further investigation.

The findings in the current study indicate that about one-third of abused and neglected individuals in the group identified a traumatic (qualifying) event from childhood. Thus, another important issue is the extent to which these individuals developed PTSD subsequent to the original event (childhood abuse/neglect) or to later trauma. Although this is clearly an important question, it cannot be answered fully here, since it requires data that are not available at present. The PTSD assessment used here (DIS) asked about up to three qualifying events and did not specifically ask respondents to recollect as far back as early childhood. For many of the abused and neglected individuals in this group, the present results most likely do not represent a complete trauma history but, rather, lower-bound estimates of PTSD. Future research is planned to address this limitation.

An obvious (but intentional) omission from this article is discussion of potential gender differences in the relationship between childhood victimization and PTSD. Since examination of gender differences in consequences of childhood victimization is complicated by gender differences in the distribution of types of childhood victimization experiences and types of psychopathology and psychiatric diagnoses (38), future research will examine gender and type of childhood victimization in relation to risk for traumatic events and for the development of PTSD. Studies have also shown that sexual abuse, perhaps more than other forms of childhood trauma, leads to dissociative problems (39). The role of intervening dissociation in the later emergence of PTSD will be examined as well.

Finally, these PTSD findings represent only part of the picture of the long-term psychiatric sequelae associated with early childhood victimization. Several articles from this project have described consequences of antisocial personality disorder (23), alcohol abuse (40), and other forms of psychopathology (41). Future work will examine the extent of comorbidity of psychiatric disorders in these abused and neglected children and comparison subjects, including an analysis of the temporal ordering of the symptoms of the disorders. Abused and neglected children appear to be at risk to develop multiple problems (39), and it is possible that other disorders, such as antisocial personality disorder, are associated with increased likelihood of PTSD (21, 22, 39, 42, 43).

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