Experiences of Traumatic Events and Associations with PTSD and Depression Development in Urban Health Care-seeking Women

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ABSTRACT *Posttraumatic stress disorder (PTSD) is an anxiety disorder that occurs after a traumatic event and has been linked to psychiatric and physical health declines. Rates of PTSD are far higher in individuals with low incomes and who reside in urban areas compared to the general population. In this study, 250 urban health care-seeking women were interviewed for a diagnosis of PTSD, major depressive disorder, and also the experience of traumatic events. Multivariate logistic regressions were used to determine the associations between traumatic events and PTSD development. Survival analysis was used to determine if PTSD developed from assaultive and nonassaultive events differed in symptom duration. Eighty-six percent of women reported at least one traumatic event, 14.8% of women were diagnosed with current PTSD, and 19.6% with past PTSD. More than half of women with PTSD had comorbid depression. Assaultive traumatic events were most predictive of PTSD development. More than two thirds of the women who developed PTSD developed chronic PTSD. Women who developed PTSD from assaultive events experienced PTSD for at least twice the duration of women who developed PTSD from nonassaultive events. In conclusion, PTSD was very prevalent in urban health care-seeking women. Assaultive violence was most predictive of PTSD development and also nonremittance.*

KEYWORDS PTSD, Depression, Trauma, Urban, Women

INTRODUCTION

Posttraumatic stress disorder (PTSD) is a stress-related disorder that occurs after the experience of a traumatic event and affects approximately 8% of individuals in the United States.¹ Traumatic events can be classified as experienced events, a witnessed event, or events that the individual learned occurred to a close family member or friend. Fifteen percent to 25% of traumatized individuals develop PTSD.^{1,2} Symptoms of PTSD include reexperiencing the traumatic event through intrusive dreams or thoughts, avoidance or arousal to stimuli that symbolize the event, and numbing of feelings after the event. PTSD symptoms resolve within 6 months in half of individuals, but can persist chronically in others.^{1,3}

Major depressive disorder (MDD) and PTSD may have a shared vulnerability in traumatized individuals. Specifically, evidence indicates that individuals with MDD are more susceptible to PTSD after a traumatic event,² and PTSD has been shown to

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mediate MDD development in traumatized individuals.^{4,5} Lastly, MDD has been shown to co-occur in almost half of individuals who develop PTSD, compounding psychological and physical health impairments.^{2,6,7}

Women develop PTSD at twice the rate of men,^{1-3,8-10} and also experience PTSD symptoms for longer periods than men.² Women's vulnerability for PTSD development may be related to the experience of assaultive events. Assaultive traumatic events including rape, sexual assault, physical assault, or being robbed, mugged, shot, or stabbed have been shown to result in substantially higher risk for PTSD development than non-assaultive events.^{1,8,12,13} Individuals who experienced one traumatic event were not at any greater risk to develop PTSD compared to nontraumatized controls; however, individuals who reported experiencing two or three traumatic events were two to three times more likely to develop PTSD than nontraumatized controls.^{1,3,12} Assaultive events perpetrated by a known assailant and which may take place over time, such as childhood sexual abuse and intimate partner violence (IPV), place women at high risk for PTSD development. Longitudinal and cross-sectional studies have shown the duration and severity of abuse to be related to the risk for PTSD development, particularly in individuals who experienced IPV or childhood physical or sexual abuse.^{12,14-17}

PTSD is more prevalent among individuals seeking health care, with rates more than triple the national rate, resulting in current PTSD rates between 8% and 14%.^{2,11,18} Furthermore, in samples of more-urban and less-insured individuals, extremely high rates of PTSD have been reported, including a study in which 30% of health care-seeking urban women were diagnosed with lifetime PTSD.¹⁹ Individuals with PTSD may be more prominent in primary care settings because of greater use of out-patient services²⁰⁻²³ and the experience of additional medical conditions.^{21,23-25}

African Americans who live in urban economically disadvantaged areas experience higher rates of trauma and PTSD than the general population.^{1,3,6,26} In a sample of health care-seeking urban African-American women, rates of current PTSD were as high as 23%.^{19,27,28} In a large epidemiologic study, rates of PTSD for nonwhites was twice as high as whites (14% versus 7%); however, these higher rates were attributed to socioeconomic status and urban residence, suggesting that these factors may congregate and result in increased risk.^{2,6}

The chronic stress of poverty and urban living may contribute to PTSD risk. Low-income urban women are confronted with chronic stressors including economic hardship, which extends to nearly every aspect of ordinary life, from difficulties meeting daily needs to dangers of substandard housing and dangerous neighborhood environments. The cumulative burden of economic hardship, witnessing violent crimes, limited health care resources, and high risk for direct victimization may tax urban women's psychological resources, increasing the risk for psychiatric and physical health declines.²⁹

Although high rates of trauma and PTSD have been reported in samples of urban African-American women, the nature of PTSD risk has not been well-characterized. Therefore, this study was undertaken in a health care-seeking urban sample of predominantly African-American women, and was guided by four specific aims: (1) to determine how many women experienced traumatic events and also the percentage who developed PTSD and MDD, (2) to identify traumatic events that were associated with an increased risk for PTSD development, (3) to determine if assaultive precipitating trauma increased the duration of PTSD, and (4) to describe the association between PTSD and MDD.

METHODS AND PROCEDURES

Participants were female patients of a primary care clinic in urban Baltimore, MD that provides health care services for individuals with limited incomes and no health insurance. English-speaking women were approached in the waiting room of the clinic between July 2005 and June 2006. Two hundred fifty subjects participated; 93.2% of those patients who were approached. If women were interested, informed consent was sought, and those who consented to participate were subsequently interviewed by the primary researcher. This study was approved by the Institutional Review Board of Johns Hopkins University. Subjects who participated in this study received a \$15 incentive.

Instruments All instruments were administered orally by the first author (J.G.), a mental health nurse practitioner, trained in Clinician Administered PTSD Scale (CAPS) administration. The Trauma Life Events Questionnaire (TLEQ), a 23-item instrument, was used to determine the occurrence of traumatic events that qualified for a DSM-IV diagnosis of PTSD.³⁰ The TLEQ identifies the types of traumatic events experienced over the women's lifetime, including repeated events such as child abuse or IPV, or episodic events such as being raped, or learning that a close family member or friend died suddenly. In addition, the age at which these events were experienced and the number of times these events occurred is also obtained from the TLEQ. The TLEQ has reported Cronbach's $\alpha=0.94$, test-retest reliability=0.89, convergent correlations with clinician interview=-.86, and the Distressing Life Event Questionnaires=0.72.³⁰

Diagnostic interviews were undertaken by J.G. using the Major Depression Inventory (MDI) and CAPS, and these interviews determined current MDD and past and current PTSD diagnoses. The MDI has reported Cronbach's $\alpha=0.93$, test-retest reliability=0.86, and convergent correlation=0.86 with the Hamilton Depression Scale.³¹ The CAPS provides both a current and past diagnosis of PTSD, and designation of the traumatic event that was most distressing to the woman and resulted in PTSD development. In addition, it provides an estimation of the duration of PTSD, the age of PTSD onset, and the type of PTSD symptoms experienced. If PTSD occurred in the past and the symptoms have now resolved, the CAPS also provides an estimation of the duration of time that the woman experienced PTSD symptoms. The CAPS has reported Cronbach's $\alpha=0.88$, interrater reliability=0.92–0.99, and convergent correlation=0.83 with the PTSD Symptom Scale Interview and 0.73 with a Structure Clinical Diagnostic Interview.³²

Statistics STATA 8.0 was used for statistical analyses. Descriptive statistics were used to describe the percentage of women reporting traumatic events, PTSD, and depression and also measures of central tendency. Multivariate logistic regressions were used to examine the following relationships: (1) association of the most distressing traumatic event reported by the women with the development of PTSD, (2) the association between the experience child abuse and subsequent experience of traumatic events in adulthood, (3) the risk for PTSD development by the number of traumatic events experienced, (4) associations between PTSD and MDD, and (5) the association between assaultive traumatic events and PTSD duration. In all multivariate logistic regression models, adjustment for subject demographic characteristics including age, race, marital status, and education was undertaken. Also, only women who reported at least one traumatic event were included in these

analyses, as not to inflate risk, as trauma is the only risk factor for PTSD development. Interactions among demographic variables were identified and included in the logistic regression if a p value of 0.1 or less was obtained.

Survival analysis was used to distinguish differing patterns of PTSD duration between those experiencing non-assaultive versus assaultive precipitating traumatic events. Survival analysis is a method to evaluate duration of conditions in a cross-sectional sample by using reports of remitted cases and also the duration of current PTSD cases. Remittance of PTSD symptoms was considered a “failure” in the survival analysis, and duration was evaluated in months. Kaplan–Meier curves were employed, as the hazard rates for the nonassaultive and assaultive PTSD groups were not proportional, as indicated by the Wilcoxon–Breslow test. The Kaplan–Meier analysis was adjusted for age, as age demonstrated significant interactions with PTSD duration in a multivariate linear regression model. All other demographic variables were tested, and none demonstrated a significant interaction with age in a multivariate linear regression model.

RESULTS

Demographics of Sample

The 250 female participants were primarily (82%) African American (see Table 1). The mean age of the sample was 46 years with most between 36 and 55 years of age (66%). Approximately three quarters (78%) of the women had graduated from high school, taken college courses, advanced career or technical training, or had graduated from college. Almost half (48.8%) reported full-time employment, and an additional 31.2% were employed part-time. Only 24% reported being currently married, and almost half (47.6%) reported never having been married.

Rates of Traumatic Events

Most women (86%) reported experiencing at least one traumatic event in their lifetime with a mean number of 5.1 ($SD=5.5$) events. In those who developed PTSD, a mean of 9.7 ($SD=7.1$) lifetime traumatic events were reported versus 4.2 ($SD=4.3$) in those women who experienced trauma, but did not develop PTSD. The most common event reported was learning of the unexpected death of a family member or close friend, which was reported by 58% of women (see Table 2). Community violence was also very common with 34.8% of women witnessing the assault or death of another person, 7.2% discovering a dead body, and 14% being mugged or robbed.

Episodic assaultive violence committed by a non-intimate partner was also very prevalent in this sample with 49.8% of women reporting this event occurring at least once in their lifetimes, and the most common events were being badly beaten or raped. Being raped at least once was reported by 11.4% of the women, and of these women, 35% reported being raped more than once. Of the women reporting being badly beaten, more than one half (62%) reported being beaten multiple times.

Events that involved physical or sexual assault and occurred multiple times in an intimate or family relationship were reported by 42.8% of participants. The percentage of women reporting traumatic events and the mean duration of the events in months were: IPV 32.8% and 90.9 ($SD=99.5$), child sexual abuse 16%

TABLE 1 Demographics of the sample by characteristics of trauma status

Characteristic	Overall sample (n = 250) %	No trauma (n = 27) %	Trauma and no PTSD (n = 139) %	PTSD lifetime (n = 84) %
Race				
African American	82	77.8	81.6	82.1
White	14	14.8	13.1	16.7
Other	4	7.4	5.7	1.2
Age (years), 46.1 (SD = 10.3)				
18–24	3.6	3.7	4.1	3.6
25–35	13.6	14.8	16.4	9.5
36–45	23.6	33.3	26.2	16.7
45–55	42.4	37.0	35.3	55.9
55–65	16.8	11.1	18.0	14.3
Marital status				
Never married	47.6	51.8	49.2	45.3
Married	24	37	25.4	15.5
Separated, divorced, widowed	23.2	7.4	19.7	34.5
Education	5.2	3.7	5.7	4.7
Less than high school	8.8	7.4	5.7	14.3
High school graduate	55.6	51.9	60.7	47.6
Some college	30.4	37.0	28.7	30.9
College graduate	5.2	3.7	4.9	7.1
Employment				
Full-time	48.8	51.9	48.4	51.2
Underemployed	31.2	33.3	28.7	32.1
Unemployed	20.0	14.8	22.9	16.7

TABLE 2 Prevalence of exposure to traumatic events and risks of developing PTSD by type of trauma and specific traumatic events

Type of traumatic event	Prevalence (%) of traumatic event	PTSD (%) attributed to traumatic event	Adjusted odds ratio for PTSD development (95%CI)
Episodic assaultive violence			
Raped	15.2	17.7	7.8 (2.7–26.2)**
Other sexual assault	10.0	1.2	0.37 (0.04–3.7)
Shot or stabbed	02.4	1.2	5.3 (0.7–56.9)
Mugged or threatened with a weapon	14.0	2.4	1.1 (0.7–1.5)
Badly beaten up	19.2	08.3	3.1 (1.1–14.8)*
Repeated assaultive violence			
IPV	32.8	14.3	2.7 (1.07–6.9)*
Child physical abuse	21.6	10.7	2.9 (1.02–10.4)*
Child sexual abuse	16.0	15.5	8.1 (3.38–47.9)**
Other injury or shocking experience			
Serious car or motor vehicle accident	18.8	01.2	1.55 (0.23–10.3)
Any other kind of serious accident/injury	10.8	0.0	NA
Fire, natural disaster	4.0	0.0	NA
Diagnosed with a life-threatening illness	7.2	02.4	1.28 (0.87–6.4)
Your child diagnosed with a life-threatening illness	14.8	0.0	NA
Witnessed events			
Witnessed someone being killed or seriously injured	34.8	02.4	0.25 (0.06–1.1)
Unexpectedly discovering a dead body	7.2	0.0	NA
Learned events or close friend/relative			
Raped or sexually assaulted	16.4	02.4	1.61 (0.43–6.2)
Seriously physical attack	45.2	02.4	0.48 (0.13–1.7)
Seriously injured in a car or other accident	20.4	0.0	NA
Unexpected death	58.0	15.5	0.61 (.32–1.2)

Adjusted odds ratios controlled for age, race, marital status, and education, and interactions
** $p<0.01$, * $p<0.05$.
Both past PTSD ($n=49$) and current PTSD ($n=37$) cases were included to investigate lifetime PTSD development.

and 30.8 (SD=24.5), and child physical abuse 21.6% and 75.6 (SD=51.2), respectively. Of women reporting an IPV relationship, 43% reported having more than one violent partner in their lifetimes. Logistic regression analyses revealed the following: childhood physical or sexual abuse was associated with lifetime IPV (AOR=6.4, 95%CI=4.1–12.3, $p<0.01$) compared to a woman without this history. Furthermore, childhood sexual abuse was associated with child physical abuse (AOR=14.5, 95%CI=9.1–19.8, $p<0.00$) and adult rape (AOR=5.7, 95%CI=3.2–9.9, $p<0.00$) compared to a woman without this history.

Rates of PTSD and Risk for PTSD Development

In this sample, 14.8% of women were diagnosed with current PTSD and an additional 19.6% with past PTSD. Table 2 displays the risk for developing lifetime PTSD depending on the type of traumatic event that was reported as the most disturbing traumatic event in their lifetimes, as well as the proportion of women who attributed PTSD symptom development to that traumatic event. In these analyses, both current ($n=37$) and past ($n=49$) cases of PTSD were included to indicate the lifetime risk for PTSD resulting from each traumatic event. PTSD attributed to multiple assaultive events committed by a family member or intimate partner (child abuse or IPV) was attributed to 40.5% of PTSD cases and displayed significant associations with PTSD, including the highest adjusted odds ratio of 8.08 for child sexual abuse. The other traumatic events that were significantly associated with PTSD development in descending strength were rape, being badly beaten up, child physical abuse, and IPV (see Table 2). Episodic assaults accounted for one third of PTSD cases; rape alone accounted for 17.9% of PTSD cases. Child sexual assault accounted for 15.5% of PTSD cases, and IPV accounted for 14.3% of the cases. Although the unexpected death of a family member or close friend was reported by more than half of the women and accounted for 15.5% of PTSD cases, this event was not significantly associated with PTSD development in multivariate logistic regression models.

Of women reporting any traumatic event, nearly all (91.5%) reported multiple traumatic events. Table 3 shows the percentage of women experiencing multiple traumatic events and the risk for developing lifetime PTSD, depending upon the number of events reported. Lifetime PTSD includes both current and remitted cases of PTSD. Almost without exception, an escalation of risk for PTSD development was associated with increasing numbers of reported traumatic events. Table 3

TABLE 3 Adjusted odds ratios for PTSD by the number of traumatic events

Number of events	2–3 events	4–5 events	6–9 events	10–13 events	14–18 events	19 or more events
Prevalence (%) of experiencing traumatic events	33.2	10.8	16	12	5.2	4
Odds ratio for PTSD development (95%CI)	1.3 (1.1–2.9)**	1.8 (0.5–2.7)	3.5 (1.8–7.1)**	4.1 (1.9–9.1)**	4.9 (1.5–16.3)**	6.5 (1.7–24.8)**

Both past PTSD ($n=49$) and current PTSD ($n=37$) cases were included to investigate lifetime PTSD development.
CI: confidence interval
** $p<0.01$; * $p<0.05$

TABLE 4 Adjusted odds ratio for PTSD by number of traumatic events per category

Number of type of events	1–2 events (95%CI)	3–4 events (95%CI)	5 or more events (95%CI)
Episodic assaultive events	1.6 (1.3–2.9)*	8.3 (3.7–18.6)**	9.7 (3.9–29.7)**
Ongoing assaultive events	4.2 (2.4–7.5)**	12.5 (4.5–40.9)**	11.7 (1.5–107.2)**
Other experienced injury or shocking experience	1.8 (1.1–3.1)**	3.2 (1.1–9.3)*	3.12 (0.9–11.4)
Witnessed events	2.3 (1.3–4.0)**	4.4 (1.4–13.2)**	2.6 (1.04–6.6)* 8
Learned events	0.9 (0.5–1.5)	2.9 (1.5–5.7)**	3.2 (1.7–6.2)**

Both past PTSD ($n=49$) and current PTSD ($n=37$) cases were included to investigate lifetime PTSD development.

** $p<0.01$; * $p<0.05$

further characterizes the relationship between multiple traumatic events and PTSD risk by including the type of multiple events reported in the analysis. Multiple events committed by the same assailant (family violence) were by far the most associated with PTSD development, demonstrated by significant odds ratios with even small percentages of women reporting experiencing this event. Learned and witnessed events were also associated with PTSD, but much lower than that of assaultive events (Table 4).

Major Depressive Disorder Development and Comorbidity with PTSD

Of all participants, 10.4% had a current diagnosis of MDD. An additional 15.5% reported a past MDD episode that was either diagnosed or treated by a health care provider. PTSD was strongly associated with MDD, as 57.8% of women with current PTSD were also diagnosed with current MDD. If the woman had current PTSD, she was at high risk to also have current MDD (AOR=9.3, 95%CI=7.6–18.6, $p<0.01$) compared to women without current PTSD.

Relationship between Precipitating Traumatic Event and PTSD Duration

The median time to remission of PTSD in remitted cases ($n=49$) was 56 months. Of the women, 28.57% remitted from PTSD symptoms in 6 months or less and an additional 24.5% remitted by 1 year. PTSD persisted for extreme durations, ranging from 100 to 240 months in nearly 30% of those women who developed PTSD. Remitted PTSD cases persisted longer in women who attributed PTSD to an assaultive event (log-rank $p<0.05$) adjusting for demographics with a mean of 36.5 months in the nonassaultive group compared to a mean of 78 months in the assaultive group. PTSD attributed to an assaultive event was associated with greater risk to develop chronic PTSD (AOR=9.3, 95%CI=6.1–14.8, $p<0.05$).

Kaplan–Meier survival methods were used to compare the time to remission in women who attributed PTSD to assaultive versus nonassaultive events, and these results are presented in Figure 1. In this analysis, both current ($n=37$) and past cases ($n=49$) of PTSD were used. This figure depicts higher non-remittance rates for PTSD in the assaultive group compared to the nonassaultive group. In this analysis, age was adjusted for, as age was observed to influence PTSD duration; no other demographic variables displayed an interaction and were, therefore, not included.

FIGURE 1. Kaplan–Meier remission estimated of PTSD symptom duration in assaultive and nonassaultive cases of PTSD.

DISCUSSION

This study was unique by examining the experience of traumatic events, PTSD, and MDD in a sample of health care-seeking urban women. In addition, this study reports the associations between PTSD development and also for nonremittance of PTSD symptoms to traumatic events that were assaultive. In addition, PTSD and MDD were highly related.

This study reports high rates of assaultive and nonassaultive traumatic events and PTSD in this health care-seeking sample of urban women. Although our reported rate of 14.8% for current and 19.6% for past PTSD is nearly triple that of the population rate for women,¹ studies of health care-seeking civilian women have reported rates of 8% to 14% for current PTSD.^{18,33,34,35,36,37} The above-mentioned studies are not directly comparable, as samples were less urban and included fewer racial minorities than this study. In samples more similar to this study, extremely high rates of PTSD have been reported. Rates of PTSD as high as 23% for current and 33% for past cases were reported in samples of primarily African-American women seeking care at urban primary care clinics,^{19,38} supporting current study findings and indicating the high risk for PTSD development in urban health care-seeking women.

Assaultive violence was especially associated with PTSD development in this study. Repeated assaultive events by family members or intimate partners, including child abuse and IPV, and episodic assaultive events were differentiated and compared, both yielding associations with PTSD development. In addition, both repeated and episodic events were attributed to the majority of diagnosed PTSD cases (74%).

Compared to women without a childhood history of abuse, those who reported childhood abuse were more likely to experience IPV as an adult and also more likely to experience an adult rape than a woman without this history. Furthermore, of

those women reporting IPV, almost half reported multiple IPV relationships. These findings suggest that assaultive traumatic events place women at risk to experience additional traumatic events, resulting in a group of extremely traumatized women who are at high risk to develop PTSD and MDD. The relationship between multiple traumatic events and PTSD risk has been reported in similar samples of women^{39,40} as well as other samples of women;^{19,38,41,42,43} however, this study is unique by reporting that the experience of assault is linked to experiencing additional assaults, and results in a high risk for PTSD development.

Although PTSD is often chronic,^{1,2,3,42} risk factors for chronicity have not been well-described. In this study, assaultive events resulted in more than twice the duration of symptoms and a tenfold increase in the risk to development PTSD in a chronic nature. Breslau et al.² reported a similar trend, supporting the relationship of assaultive events to increased risk for both the development and nonremittance of PTSD in women. This study is unique by linking assault to diagnosed lifetime PTSD cases.

Our findings of high comorbidity of PTSD and MDD strengthen the assertion that these disorders are highly related, especially in women.^{3,44} Compared to PTSD subjects without MDD, those with comorbid depression have greater medical comorbidities,^{7,45} higher unemployment rates,⁴⁶ and higher rates of suicide attempts,⁴⁷ and may be more resistant to treatment.⁴⁸ In primary care settings, MDD is often assessed, yet if only MDD is recognized, its comorbidity with PTSD may go undiagnosed. Two recent studies reported that more than a third of depressed primary care patients also screened positive for current PTSD.^{38,49} Lastly, in a study of primary care patients, only 11% of research participants diagnosed with current PTSD had a diagnosis of PTSD in their charts.³⁸ Therefore, recognition and treatment of PTSD in primary care settings may be the most efficacious way to improve both mental and physical health of traumatized women. If women with these related chronic physical health problems are treated only with traditional medical remedies without addressing the underlying trauma response, the pattern of continued health visits without improvement of symptoms may be likely to continue.

This study provides further evidence of high rates of PTSD in health care-seeking urban women;^{6,38} however, it does not provide insight into the reasons for increased risk or how best to intervene. Previous studies have linked early trauma, multiple victimizations, chronic exposure to community violence, and also inadequate medical resources to high PTSD risk in low-income urban women.^{1,2,50,51} Understanding the reasons for elevated PTSD risk may lead to improved screening methods and the development of interventions targeted to low-income urban women. General interventions for PTSD in primary care settings include medication, short-term psychotherapy, and referral to psychiatric clinics,^{52,53} yet urban women may have unique needs. Social support,⁵⁴ spiritual well-being,⁵⁵ and integrated treatment for alcohol and drug abuse^{56,57} have been identified as needs of traumatized urban women. Integrating these or other unique needs may improve treatment of PTSD in urban women.

There are limitations in the current study that should be mentioned. First, this study was cross-sectional and only included urban health care-seeking women. In addition, the sample size limited the examination of other factors that may have influenced the associations among the experience of traumatic events and development and duration of PTSD. Lastly, by including only women, gender comparisons were not possible.

In conclusion, health care-seeking urban women displayed high rates of trauma and those who developed PTSD exhibited multiple health impairments. This study

provides additional incentive for improved assessment and treatment of PTSD in primary care, the setting where women most often present with PTSD symptoms. By treating PTSD symptoms, physical health impairments may also improve; however, treating urban women with PTSD may require more than standard treatment approaches.

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