

Do Women Get Posttraumatic Stress Disorder as a Result of Childbirth?

A Prospective Study of Incidence

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ABSTRACT: Background: Recent research suggests that a proportion of women may develop posttraumatic stress disorder after birth. Research has not yet addressed the possibility that postpartum symptoms could be a continuation of the disorder in pregnancy. This study aimed to test the idea that some women develop posttraumatic stress disorder as a result of childbirth, and to provide an estimate of the incidence using a prospective design, which controls for the disorder in pregnancy. **Method:** This prospective study assessed 289 women at three time points: 36 weeks gestation and 6 weeks and 6 months postpartum. The prevalence of posttraumatic stress disorder was assessed by questionnaire at each time point, and the incidence was examined after removing women who had severe symptoms of posttraumatic stress disorder or clinical depression in pregnancy. **Results:** After removing women at the first time point, 2.8 percent of women fulfilled criteria for the disorder at 6 weeks postpartum and this decreased to 1.5 percent at 6 months postpartum. **Conclusions:** The results suggest that at least 1.5 percent of women may develop chronic posttraumatic stress disorder as a result of childbirth. It is important to increase awareness about the disorder and to give health professionals access to simple screening tools. Intervention is possible at several levels, but further research is needed to guide this intervention. (BIRTH 28:2 June 2001)

Posttraumatic stress disorder was formally recognized in 1980 in the Diagnostic Statistical Manual of the American Psychiatric Association 3rd revision (DSM-III) (1) as following on from a traumatic event. Early criteria restricted the disorder to objectively unusual or severe events. For example, DSM-III-Revised (2) specified that the event had to be "outside the normal range of experience," and the International Classification of Diseases (10th revision) (3) of the World Health Organization specified that the event must be "likely to cause pervasive distress in almost anyone." However, it has become increasingly apparent that

posttraumatic stress disorder-like symptoms can occur in individuals who are not exposed to an unusual event (4), or even to an acute stressor (5). Symptoms have been reported after events as varied as war (6), road traffic accidents (7), diagnosis of cancer (8), myocardial infarction (9), being a victim of crime (10), rape or assault (10), or child abuse (11). Secondary posttraumatic stress disorder has also been reported in individuals close to those involved in a traumatic event such as rape, assault, homicide, or disasters (12).

In 1995, DSM-IV (13) changed the event criterion to recognize that an individual's perception of threat and response to an event critically affect the subsequent development of posttraumatic stress disorder. Thus, a less unusual event can result in the disorder if the individual believed that his or her life was endangered, or that a serious threat existed to the physical integrity of themselves or others. Symptoms of posttraumatic stress disorder fall into three clusters: reexperiencing the event through intrusive thoughts, nightmares, or flashbacks; avoidance of factors associated with the

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event and emotional numbing; and increased arousal such as hypervigilance and irritability. For a diagnosis of posttraumatic stress disorder, symptoms must cause significant distress or impairment and must continue for longer than 1 month.

In 1978 Bydlowski and Raoul-Duval reported *la nevrose traumatique post-obstetricale* after long, difficult births, or births in which the infant was handicapped or stillborn (14). Various examples can also be found in the childbirth literature, suggesting that childbirth can be a traumatic event with a lasting psychological impact. For example, Beech and Robinson (15) write of women suffering severe nightmares about birth, often years later. They note that these women "seem to have suffered excessively painful and traumatic deliveries, often with unsympathetic staff" (15, p 586). Arizmendi and Alfonso (16) reported that women specified memories of labor and delivery as the second most disruptive factor postpartum (worries about the health of their baby were rated as the biggest stressor). Other research reports that between 17 and 86 percent of women report "missing pieces" in their memory of birth, or mental confusion during birth (17,18).

It is only recently that posttraumatic stress disorder has been explicitly linked with childbirth. To date, 10 case studies have been reported (19–23). Nine of these cases were diagnosed after childbirth and 1 case arose after a late abortion for which the woman had to go through the birth process (20). However, it is possible that these women had posttraumatic stress disorder *before* childbirth and that their symptoms were exacerbated by childbirth, subsequently transferred onto childbirth, or both. Despite increasing clinical awareness and interest (24), it is still unknown whether new cases of posttraumatic stress disorder occur as a result of childbirth. Research that attempts to ascertain incidence makes estimates that vary from 1 to 6 percent for clinical cases (19,25–27) and from 6 to 24 percent for severe symptoms (26,28,29). Unfortunately, this research is either based on post-hoc analyses of data that do not use specific posttraumatic stress disorder measures (28), include other gynecologic or obstetric traumas in addition to childbirth (29), are not fully reported (19), do not use standard measures (25), or do not control for posttraumatic stress disorder in pregnancy (26, 27). Most of this research is also cross-sectional or retrospective, which makes it impossible to determine whether the disorder predated childbirth or arose as a result of it.

If posttraumatic stress disorder does occur as a result of childbirth, it has diagnostic, epidemiologic, theoretical, and practical implications. From an epidemiologic standpoint, the likelihood of depression in the postpartum period may receive a contribution from a misdiagnosed subgroup of women who are, in fact, suffering

from posttraumatic stress disorder. Reviews of comorbidity show that depression commonly occurs in people with the disorder (30). Thus it is important that health professionals are made aware of the possibility of postpartum posttraumatic stress disorder so that women are not misdiagnosed as suffering from postnatal depression. Practically, if the disorder is found after childbirth, prevention or intervention may be possible at various levels, such as primary prevention (prevention of onset), secondary prevention (early recognition and treatment), and tertiary prevention (rehabilitation).

From a theoretical standpoint, in the past it has been difficult to look at etiologic factors in posttraumatic stress disorder prospectively, since traumatic stressors are rarely predictable. Most prospective research has studied people pre-morbidly but *after* the traumatic event (31). The few investigations in which pre-event baseline measures are available are usually opportunistic, and the baseline measures available do not cover the range of psychosocial events that may be important in posttraumatic stress disorder (32). Childbirth is a naturally occurring and predictable event, which allows the role of different variables in the onset and maintenance of posttraumatic stress disorder to be evaluated prospectively.

Thus, although the examination of posttraumatic stress disorder after childbirth has several potential implications, at present little research has been conducted in this area. The most pressing issue is to confirm whether new cases of posttraumatic stress disorder really do occur as a result of childbirth and, if so, what proportion of women are affected. The purpose of the present study was to examine whether or not women develop this disorder after childbirth, and to provide a preliminary estimate of incidence.

Materials and Method

Design

This study was part of a prospective investigation using questionnaires to examine the proportion of women who had posttraumatic stress disorder prenatally and postpartum, and the role of psychosocial variables in the etiology of the disorder. Women completed questionnaires at 3 time points: 36 weeks' gestation (mean 35.7 wk, SD 2.0), 6 weeks postpartum (mean 7.2 wk, SD 2.2), and 6 months postpartum (mean 6.7 mo, SD 1.4). Posttraumatic stress disorder was measured at every time point.

The study took place at a large hospital in London between December 1996 and March 1998. Women were recruited from antenatal clinics and were included if they were between 16 and 36 weeks' gestation, spoke English well, and were planning a normal labor (i.e.,

were not booked for an elective cesarean). Of the 293 women who agreed to participate in the study, 4 suffered a perinatal or neonatal death and were subsequently excluded. Questionnaires were sent to women by mail with a reply-paid envelope. If questionnaires were not returned within 10 days, the researcher followed them up by telephone or mail up to three times. Not all women returned the questionnaires at every time point: 77 percent returned the questionnaire in pregnancy, 75 percent returned the questionnaire at 6 weeks postpartum, and 70 percent returned the questionnaire at 6 months postpartum.

Measures

Establishing cases of posttraumatic stress disorder arguably requires diagnostic interviews carried out by trained clinicians. However, the demand of epidemiologic research for large samples has resulted in the more frequent use of survey-type interviews (administered by nonclinicians) or self-report measures of posttraumatic stress disorder. Both methods are easily applied and enable large numbers of participants to be incorporated in prevalence research (29). Standard self-report questionnaires were used in this study, which were carefully evaluated for reliability and validity.

Posttraumatic stress disorder in pregnancy was measured using the MMPI-2-Post-traumatic Stress Disorder Scale (34), an empirically derived questionnaire adapted from the Minnesota Multiphasic Personality Inventory. Forty-six items are phrased with reference to the individual as opposed to an event. This allows current posttraumatic stress disorder to be measured without reference to a specific traumatic event. This tool is particularly useful in samples, such as pregnant women, where not all participants are likely to have a history of trauma. Responses are given on a dichotomous true or false scale. The scale has been widely used to measure posttraumatic stress disorder and has an internal reliability of 0.95 and test-retest reliability over 2 to 3 days of 0.94 (35). The scale is strongly related to posttraumatic stress disorder symptoms such as intrusive memories, flashbacks, and detachment (36), and a cutoff score of 21 results in a sensitivity of 0.83 and a specificity of 0.79 in civilian samples (37).

Posttraumatic stress disorder postpartum was measured using the Post-traumatic Stress Disorder Symptom Scale (PSS) (38). This tool has the advantage of following DSM-IV criteria, being able to be referred to childbirth, and having very high specificity. The PSS consists of 17 items corresponding directly to DSM-IV criteria (4 reexperiencing, 7 avoidance, and 6 arousal items), which are scored on a 4-point scale

from "not at all" to "very much." Dunmore et al added an 8-point disability scale to the PSS to include the DSM-IV disability criterion (39,40). They suggested a more conservative scoring method of 18 or higher on frequency of symptoms and 2 or higher on disability for classification of posttraumatic stress disorder cases.

The PSS has high internal consistency with an alpha of 0.91. The subscale alphas are 0.78 for reexperiencing, 0.80 for avoidance, and 0.82 for the arousal subscale. Overall test-retest reliability is 0.74, with the subscales showing test-retest reliability of 0.56 to 0.71. The PSS correlates 0.81 with the Impact of Event Intrusion subscale, and has a specificity of 1.0 and a sensitivity of 0.62 using the Structured Clinical Interview for DSM (SCID), with an overall hit rate of 86 percent (38). Norris and Riad concluded that the PSS has excellent reliability and "the validity data surpass that available on other civilian scales" (41). The relatively low sensitivity of the scale, however, suggests that the PSS is a conservative measure of posttraumatic stress disorder cases, which was deemed prudent for the present study, given the controversial nature of the disorder after childbirth.

The fact that the PSS does not produce false positives (specificity of 1) is extremely important for the present study, the major aim being to establish prospectively if postpartum posttraumatic stress disorder is a genuine phenomenon. If any cases were identified by the PSS in this study, we could be confident that they were real cases and safely conclude that the incidence of posttraumatic stress disorder was greater than 0 percent. Thus the scale can provide a conservative and prospective estimate of the incidence rate.

Depression was measured using the 28-item General Health Questionnaire (GHQ-28) (42). This tool was originally designed as a 60-item questionnaire to measure nonpsychotic psychiatric disorder in community populations. The 28-item version was extracted from factor analysis of the GHQ-60 that tried to find the best solution where items measuring depression and anxiety loaded on separate factors and could therefore be measured by separate subscales. The resulting scale has four subscales of depression, anxiety, somatic symptoms, and social dysfunction.

Items on the GHQ-28 have a four-point response scale, which is conventionally scored 0 0 1 1 when screening for clinical cases (43,44). The range is therefore 0 to 7 and the suggested cutoff is 4. This cutoff gives a sensitivity of 0.86 to 1.0, a specificity of 0.76 to 0.87, and an overall misclassification of 13.6 to 17.5 percent (42-44). Reliability tests on larger versions of the GHQ give high test-retest reliability of 0.90 over 6 months and a split-half reliability of 0.83 to 0.95 (42).

Data Analyses

t Tests and chi-square were used to analyze differences between responders and nonresponders for continuous and categorical variables, respectively. Prevalence and incidence rates are reported as percentages with 95% confidence intervals. Upper and lower bounds are also calculated to account for nonresponders.

Results

Sample Characteristics

Women were age 14 to 46 years (mean 30.2, SD 5.5) and were from various occupations and ethnic groups. Fifty-two percent of the sample were nulliparous and 48 percent multiparous; 97.7 percent gave birth at St. George's Hospital, 2 percent at home, and 0.3 percent at a birth center. Sample characteristics for the main demographic variables are shown in Table 1. The study sample had a large proportion of ethnic groups, women with higher educational qualifications, and professional groups.

Nonresponders

Incidence rates can be calculated as a percentage of the eventual sample (responders) or as a percentage

Table 1. Sample Characteristics on Main Demographic Details

Demographic Variables	Sample No. (%)
Marital status	
Married	143 (62)
Living with partner	59 (26)
Single or separated	27 (12)
Ethnic group	
Caucasian	158 (69)
African or Afro-Caribbean	39 (17)
Indian, Pakistani, or Bangladeshi	22 (10)
Other	9 (4)
Level of education	
None	23 (10)
GCSE or equivalent	49 (21)
A-levels or equivalent	74 (32)
Degree	34 (15)
Higher degree or professional qualification	48 (21)
Occupation	
Employers & managers	36 (16)
Professional workers (employees)	25 (11)
Nonmanual workers	105 (46)
Personal service workers	21 (9)
Skilled/semiskilled manual workers	10 (4)
Unskilled manual workers	11 (1)
Self-employed	4 (2)
Unemployed or not adequately stated	24 (11)

GCSE = General Certificate of Secondary Education.

of the potential sample (including nonresponders). To ascertain which is the most accurate, it is important to determine if nonresponders differed significantly from responders on baseline characteristics. Analyses of differences between responders and nonresponders are shown in Table 2. These analyses are based on women who did not respond at 6 months postpartum. Nonresponders were significantly younger and less educated, and comprised a higher proportion of African and Afro-Caribbean women and single or separated women. However, they did not differ significantly from responders on any of the measures of psychopathology completed during pregnancy, including posttraumatic stress disorder symptoms.

Posttraumatic stress disorder

Since posttraumatic stress disorder symptoms in pregnancy did not differ significantly between nonresponders and responders, the estimates of incidence reported here were based on the proportion of responders who fulfilled criteria for the disorder (Table 3). To give an indication of the sensitivity, however, further rates were calculated to provide an upper and lower bound of incidence according to the status of nonresponders by calculating the percentage of women with posttraumatic stress disorder if, first, all nonresponders did not evidence the disorder, and second, all nonresponders evidenced the disorder. At its most conservative, if all nonresponders did not evidence the disorder, this decreased the rate of the disorder to 2 percent at 6 weeks postpartum and 1 percent at 6 months postpartum. Alternatively, if all nonresponders evidenced the disorder, it increased the rate of the disorder to 27 percent at 6 weeks postpartum and 31 percent at 6 months postpartum.

Discussion and Conclusions

This study showed that 2.8 percent of women fulfilled criteria for posttraumatic stress disorder at 6 weeks postpartum and 1.5 percent at 6 months postpartum. Thus, this research indicates for the first time in a prospective study that the incidence of posttraumatic stress disorder as a result of childbirth is probably above zero. However, two factors need to be taken into consideration when interpreting these findings. First, the sample was not wholly representative of the population for a few variables, and second, missing data imply that incidence rates cannot be established definitively.

How Accurate Are the Incidence Rates?

This study is important because it provides the first prospective evidence to suggest that new cases of post-

traumatic stress disorder *do occur* as a result of child-birth. What is the true incidence likely to be? Calculations of the upper and lower bounds, which accounted for nonresponders, suggest that the true incidence of posttraumatic stress disorder at 6 months postpartum could be between 1 and 31 percent. However, confidence intervals suggest the actual incidence in the population could range from 0 to 3 percent. For a number of reasons we believe that the rate of 1.5 percent reported in this study is a conservative estimate of incidence. First, the measure used (the PSS) is a highly valid but conservative instrument. The PSS has been validated against diagnostic interviews where the

PSS found 62 percent of cases of posttraumatic stress disorder and was 100 percent sensitive (i.e., no false positives). Second, the incidence levels found in this study are similar to those reported in previous research. For example, Czarnocka and Slade studied 298 women in the United Kingdom, 6 weeks after giving birth, and found 3 percent who fulfilled criteria for posttraumatic stress disorder (26). Another study of women at 6 weeks postpartum, which used the same measure as the current study, found a prevalence of 5.6 percent (27). This is similar to the point prevalence of 6.9 percent in our study. At 6 months postpartum the 1.5 percent found in our study is also similar to that re-

Table 2. Differences in Baseline Characteristics of Responders and Nonresponders (Based on Responders at 6 Months Postpartum)

<i>Baseline Variables</i>	<i>Responders (n = 201) Mean (SD) or Frequency</i>	<i>Nonresponders (n = variable)‡ Mean (SD) or Frequency</i>	<i>Significance</i>
Age (yr)	30.80 (4.86)	27.61 (6.78)	$t = 3.16, df 64^*$
Age left education (yr)			
16 or under	32%	60.5%	$\chi^2 = 12.82^*$
18	18%	18.5%	
Higher education	50%	21%	
Ethnic group			
Caucasian	72%	55%	$\chi^2 = 14.21^*$
African/Afro-Caribbean	13%	37%	
Asian	11%	3%	
Other	4%	5%	
Marital status			
Married	68%	37%	$\chi^2 = 17.42^\dagger$
Cohabiting	24%	34%	
Single/separated	8%	29%	
Parity			
Nulliparous	53%	49%	$\chi^2 = 0.29, ns$
Multiparous	47%	51%	
Delivery type			
Vaginal	67%	68%	$\chi^2 = 0.22, ns$
Assisted vaginal	16%	14%	
Cesarean	17%	18%	
Complications with baby			
Yes	68%	69%	$\chi^2 = 0.22, ns$
No	32%	31%	
Posttraumatic stress disorder symptoms in pregnancy (MMPI-2-PTSD)	8.32 (7.20)	9.09 (8.03)	$t = -0.56, df 220, ns$
Depression in pregnancy (GHQ)	0.98 (2.37)	1.59 (2.89)	$t = -1.37, df 221, ns$
Somatic symptoms in pregnancy (GHQ)	6.45 (4.04)	6.28 (4.15)	$t = 0.23, df 220, ns$
Anxiety in pregnancy (GHQ)	7.14 (4.77)	8.62 (4.97)	$t = -1.68, df 221, ns$
Social dysfunction in pregnancy (GHQ)	9.19 (2.96)	8.82 (3.48)	$t = 0.66, df 221, ns$
Psychopathology in pregnancy (total GHQ)	23.76 (10.84)	25.47 (11.37)	$t = -0.84, df 220, ns$

GHQ = General Health Questionnaire (28 item version); MMPI-2-PTSD = Keane posttraumatic stress disorder scale.

* $p < 0.005$.

† $p < 0.001$.

‡Baseline data were not available for all women who did not respond to the questionnaire at 6 months postpartum ($n = 91$). Therefore n varies between analyses and ranged between 34 and 88.

Table 3. Proportion of Women with Posttraumatic Stress Disorder in Pregnancy and Postpartum

<i>Posttraumatic Stress Disorder</i>	<i>Pregnancy</i> (n = 222) No. (%)	<i>6 weeks</i> (n = 218) No. (%)	<i>6 months</i> (n = 201) No. (%)
Point prevalence	18 (8.1)	15 (6.9)	7 (3.5)
95% CI	(4.5–11.6)	(3.6–10)	(1–6)
Incidence: removing women with posttraumatic stress disorder in pregnancy*		7 (3.2)	4 (2)
95% CI		(0.9–5.5)	(0–4)
Incidence: removing women with posttraumatic stress disorder and/or depression in pregnancy		6 (2.8)	3 (1.5)
95% CI		(0.6–5)	(0–3)

*Women who fulfilled criteria for posttraumatic stress disorder postpartum but did not complete the questionnaire in pregnancy were also removed in case they had the disorder in pregnancy. Including these women results in an incidence of 4.6% at 6 weeks postpartum and 3% at 6 months postpartum.

ported in previous studies (19,25). For example, in Wijma et al's cross-sectional study of 1640 Swedish women who gave birth over a 1-year period, the incidence was 1.7 percent, based on retrospective reports (25). In addition, our previous investigation, which examined women with moderate to severe posttraumatic stress disorder symptoms and conducted diagnostic interviews to establish the proportion of women who developed the disorder, found an incidence of 1 percent (S. Ayers, A. Pickering, A. Kent, J. Cockburn, R. Jacobson, 1995; unpublished data). Although this earlier study also suffered from problems of attrition, the similarity of incidence adds validity to the 1.5 percent reported in the current study.

Despite the availability of evidence that supports an incidence of approximately 1.5 percent, we cannot ignore the confidence intervals presented in Table 3. They suggest that the incidence of postnatal posttraumatic stress disorder in the population may be negligible by 6 months postpartum. Further clarification is therefore essential.

Can We Generalize These Results?

This study sample differed from the population in the United Kingdom on a number of variables. It included a large proportion of married or cohabiting women, which is to be expected in a sample of pregnant women. In addition, many study women were from minority ethnic groups, with high educational qualifications, and in professional occupations. It can therefore be argued that the posttraumatic stress disorder incidence found in this sample will not necessarily be representative of that for United Kingdom births as a whole. However, since the current findings are consistent with previous research conducted in different hospitals and in different countries (19,25), this suggests a similar incidence may occur in other samples.

Course of Posttraumatic Stress Disorder

The finding that the percentage of women with the disorder was higher in pregnancy than it appeared to be after birth, and that its prevalence decreased over time postpartum, deserves comment. The difference in rates in pregnancy and postpartum is probably due to the use of different measures of posttraumatic stress disorder. The measure used in pregnancy (MMPI-2-PTSD Scale) was deliberately selected because it is the only widely used scale that is not event specific. In other words, it provided a measure of current symptoms in pregnancy without women having to specify the precipitating event, which was likely to vary greatly between individuals and would have made completing the questionnaire difficult for women who had no history of a traumatic event. Because of its origins (it was empirically derived from the MMPI), the measure does not measure DSM-IV criteria. By contrast, the measure used postpartum (PSS) specifically referred to the event of childbirth and covered DSM-IV criteria. Stringent scoring criteria were used postpartum to ensure excellent specificity. The lower specificity of the measure used in pregnancy suggests that other psychiatric disorders or distress may have inflated the rate of posttraumatic stress disorder found in pregnancy. Although this inclusion of other disorders in the pregnancy measure means that the prevalence rates in pregnancy should be treated with caution, it also means that women with preexisting psychopathology, other than posttraumatic stress disorder, were probably excluded from postpartum incidence rates. This supports our belief that the incidence figures for the postpartum period are conservative.

The results also showed a decrease in the disorder between 6 weeks and 6 months postpartum, which is consistent with other research showing that many cases recover spontaneously during the first 6 months after

the traumatic event (45). After 6 months much less spontaneous recovery is usually observed, indicating that women with the disorder at this point are likely to continue as chronic cases and therefore require treatment. On the basis of an incidence of 1.5 percent, approximately 10,000 chronic cases of posttraumatic stress disorder may be expected to develop every year in England and Wales as a result of childbirth.

Implications

The possibility that many women may develop this disorder every year as a result of childbirth is one that needs to be urgently addressed, particularly since far-reaching secondary effects are likely. Aside from the deterioration in the mental health of affected women, effects may be seen on the infant and other children, such as developmental or behavioral problems, and on the family unit as a whole. Lack of recognition of posttraumatic stress disorder after childbirth heightens the probability of women mislabeling their symptoms. In addition, the common comorbidity of the disorder with other disorders, such as depression and substance abuse, suggests that if women are not diagnosed early they may well be treated on the basis of secondary psychopathology, which may be unsuccessful. Thus, the psychological, social, and economic cost of the disorder in these women could be great.

Primary prevention may be possible if vulnerable women are identified in pregnancy, for example, by screening for known vulnerability factors. Establishing the identity of these factors is an important next step, and it is imperative that intervention is guided by research and is properly evaluated. Vulnerable women could be offered alternative birth procedures or their notes could be highlighted so that obstetric staff will avoid doing procedures likely to cause distress.

Secondary prevention can be implemented by screening women for a severe traumatic stress response after birth. Such women could be offered treatment, such as debriefing or counseling sessions, although the use of debriefing with postpartum women is currently surrounded by controversy and shows little evidence that it is effective (46,47). Tertiary prevention is possible if vulnerable or traumatized women are followed up in the long term to identify those who develop chronic posttraumatic stress disorder so that they can be offered further treatment, perhaps in conjunction with their family to address secondary effects.

Finally, raising awareness of the possibility of posttraumatic stress disorder postpartum will help affected women understand their symptoms and prevent misdiagnosis. Health professionals who care for postpartum women should be given access to questionnaire mea-

asures of posttraumatic stress disorder as simple screening tools to enable them to identify the disorder.

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