ORIGINAL ARTICLE

Depression and posttraumatic stress disorder among road traffic accident victims managed in a Tertiary hospital in Southern Nigeria

JE Asuquo, BE Edet[1], IE Abang, EA Essien[1], OG Osakwe, EJ Aigbomain, KC Chigbundu

Department of Orthopaedics, University of Calabar Teaching Hospital, [1]Federal Neuropsychiatric Hospital, Calabar, Nigeria

Abstract

Background: Psychological responses to traumatic events vary widely across different cultures but studies in the developing countries are scant. The objective of this study is to determine prevalence of depression and posttraumatic stress disorder (PTSD) among patients involved in road traffic accident (RTA) compared with that of the general population using a matched control group.

Materials and Methods: The study design was case control and employed the convenient sampling technique. All consecutive attendees of the trauma clinic of a Tertiary Hospital who had been involved in RTA in the previous year and met inclusion criteria were recruited to participate in the study. Controls were drawn from patient relatives attending other clinics in the same hospital. The final sample comprised of 46 cases and controls, totaling 92 participants. A Sociodemographic questionnaire, the PTSD, and depression modules of the Mini International neuropsychiatric interview were administered to both groups by trained research assistants. The data were analyzed using IBM SPSS version 22. Statistical significance was set at 0.05.

Results: The prevalence of PTSD among cases was 41.3% compared with 13% among controls, whereas the prevalence of depression among cases was 63% compared with 30.4% among the controls. Both of these findings were statistically significant ($P < 0.002$). Sociodemographic variables such as age, sex, marital status, religion, level of education, and occupation did not have statistically significant relationship with neither PTSD nor depression.

Conclusion: Mental disorders such as PTSD and depression are common in victims of RTA. They would benefit from comanagement with mental health specialists.

Key words: Posttraumatic stress disorder, depression, road traffic accidents

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Introduction

Posttraumatic stress disorder (PTSD) is a disorder that occurs after direct personal experience, witnessing or learning of a traumatic event that caused actual or

Address for correspondence:
Dr. JE Asuquo, Faculty of Medicine and Dentistry, Department of Orthopaedic Surgery, College of Medical Science, University of Calabar, Calabar, Nigeria.
E-mail: itansuq@unical.edu.ng

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threatened dead or injury during which there is a response with intense fear, horror, and helplessness[1]. It can be acute (symptoms lasting less than 3 months), chronic (duration of symptoms 3 months or more), or with delayed onset (symptoms develop 6 months or more after the stressor).[1] Symptoms are categorized into three groups, which include reexperiencing phenomena, hyper arousal, avoidance, and numbing symptoms. It is potentially preventable with a 50% chance of remission at 2 years.[1] PTSD is often comorbid with other psychiatric disorders.[1,2] Life time prevalence in the general population is low, is ranging from 0.56 to 6.67% in Europe and 8% in the USA.[2]

Earlier accounts on PTSD were in railway workers among whom it was described as "railway spine" and as "war neurosis", "shell shock", and "postvietnam syndrome" among combat veterans. It has also been found to develop in civilians who are exposed to extreme physical and emotional trauma.[2-4] Some risk factors such as exposure to early-life trauma (e.g., childhood abuse), interpersonal violation, family death, disasters, and so on modify the development of anxiety disorder and depression in adulthood.[5] PTSD has been shown to occur at a higher prevalence following involvement in a road traffic accident compared with the general population. As reported by Ursano *et al.*[6], rates could be as high as 34% at one month, 18% at 6months, and 14% at 12months postaccident. Ehlers *et al.*[7] also reported PTSD rates of 23.1% at 3months and 16.5% at one-year postinjury, respectively.

Depression is a common mental disorder that presents with depressed mood, loss of interest in previously pleasurable activities, decreased energy, guilt or low self-worth, disturbed sleep or appetite, and poor concentration.[8] The lifetime prevalence of depression in the general population is about 10–20%.[9] Depression is one of the commonest disorders reported in persons involved in motor vehicle accidents.[10] Prevalence of depression reported could be as high as 19 and 16.7% at one month and 3 months, respectively, after involvement is a road traffic accident.[10,11]

PTSD and depression have been found to be commonly comorbid among survivors of road traffic accident (RTA). They are thought to be separate disorders that develop independent of each other in crash victims.[12] Blanchard *et al.*[13] reported 48% of his sample patients met the criteria for both PTSD and depression. Kolawole *et al.*[14] in a Nigerian study, found that 33.7 and 36.5% of persons who were survivors of RTA had PTSD and depression, respectively. He also found both conditions to be comorbid in 76%. He, however, did not use a diagnostic instrument to confirm the presence of these disorders. Iteke *et al.*[15] reported a PTSD rate of 26.7% in RTA victims compared with the control. He also found PTSD to be commoner among women and those who were gainfully employed prior to the RTA. He did not assess for the presence of depressive symptoms.

RTAs are a recognized cause of trauma worldwide especially in Nigeria where one out every three Nigerian is at risk of being killed or getting injured in RTA.[14] Anxiety and depressive disorders are usually under diagnosed in our environment because of sociocultural beliefs, even among victims of RTAs wherein the primordial concern is wound healing without recourse to psychopathological healing.[14] These can impact negatively on rehabilitation and reintegration into society, if there is associated impairment.

To the best of our knowledge, only one Nigerian study has assessed for the presence of both PTSD and depression among survivors of RTAs. An important limitation of the study was the use of screening tools instead of a clinician administered diagnostic instrument in assessing the said disorders. On the whole, studies on psychological sequela of RTA survivors in Nigeria are few.

In our study, we seek to investigate the prevalence of PTSD and Depression in patients attending the trauma clinic of a tertiary hospital in southern Nigeria, who had been involved in RTAs in the previous year, compared with a control group who are not involved in RTA matched for age and sex.

Materials and Methods

This is a case-control study conducted among patients attending the orthopedic and trauma clinic of a tertiary hospital with 400 beds, located in the southern Region of the country. The orthopedic unit is one among its several departments, which manages cases as inpatients or outpatients. The study recruited consecutive patients attending the outpatient clinic between the months of March and July, 2015, who met the inclusion criteria, which included involvement in a RTA at least 12 months prior to time of study and provision of verbal consent for the study. Exclusion criteria included were past history of psychiatric morbidity and presence of other major medical or surgical comorbidity. The latter were excluded to increase the likelihood that detected psychiatric morbidity was as a result of stress following involvement in RTA.

Using the convenient sampling method, 46 patients who met the criteria were recruited into the study. The researchers strove to recruit all the patients who attended the clinic within the time frame of the study and met the inclusion criteria. The sample size was, therefore, determined and limited by the number of patients meeting the study criteria, available during the study time frame. An equal number of controls were recruited among patient relatives who accompanied patients attending outpatient clinics of other departments in the hospital. Inclusion and exclusion criteria were identical except that these controls should not have been involved in RTAs.

A Sociodemographic questionnaire, the Depressive and PTSD Modules of Mini-International Neuro-psychiatric Interview (MINI) were employed in this study. The Sociodemographic questionnaire elicited variables such as age, sex, marital status, religion, occupation and level of Education.

The MINI was designed to meet the need for a short but accurate, structured psychiatric interview for multicenter clinical trials, and epidemiological studies.[16] It is a widely used structured interview for assessing Axis I disorders.[16] As its creation has been translated into 43 languages, and has demonstrated impressive validity and reliability, making it ideal for cross-cultural research.[17,18] The MINI is divided into modules, each corresponding to a diagnostic category of the Diagnostic and Statistical manual of mental disorders (DSM-IV). Screening questions are presented at the beginning of each module with an administration time of, approximately, 15 min. Only the modules for diagnosis of depression and posttraumatic stress disorder were used in this study. The MINI has been used in several studies in Nigeria.[19,20]

Statistical Analysis was done using IBM SPSS software version 22 (registered trade mark of the International Business Machine Corporation). *P*-value of 0.05 was considered statistically significant. Prevalence of PTSD and depression were determined in both groups. Statistically significant associations were analyzed using *t*-test and chi square tests wherein necessary.

Results

Forty six patients who had been involved in a RTA in the previous year were recruited to participate in the study. Also, recruited were 46 controls, matched for age and sex.

[Table 1] displays the sociodemographic characteristics of the sample. Fifty-four (58.2%) were between the ages of 21 and 40 years and 36 (38.8%) were above 40 years, whereas just two (3%) were aged 20 and below. Men were the majority and constituted about 65% of the sample, whereas about 35% were women. Most of the respondents were married (52.2%), whereas single, separated/divorced, and widowed respondents comprised 40.2, 2.2, and 5.4% of the sample, respectively. The majority of the respondents had attained university education (43.5%), followed by those who had attained secondary education (27.2%). As regards occupation, the majority were employed in government or private organizations (48.9%) followed by those who were self-employed (22.8%). Other details concerning the sociodemographics are shown in [Table 1].

[Table 2] compares the prevalence of PTSD and depression between case and noncase. It was found that 19 (41.3%) of 46 patients that had been involved in RTAs within a year met the diagnostic criteria for PTSD compared with only six (13.0%) of the controls. This finding was statistically significant ($P = 0.002$).

It was also observed that 29 (63.0%) of 46 patients who had been involved in a RTA within a year had a diagnosis of depression compared with 14 (30.4%) among controls. This finding was statistically significant ($P = 0.002$).

Table 1: Sociodemographic variables

Variable	Frequency ($n = 92$)	Percentage
AGE		
1–20	2	2.2
21–40	[54]	58.7
>41	[36]	39.1
Sex		
Male	60	65.2
Female	32	34.8
Marital status		
Single	37	40.2
Married	48	52.2
Separated/divorced	2	2.2
Widowed	5	5.4
Religion		
Christianity	91	98.9
Islam	1	1.1
Level of education		
No education	4	4.3
Primary	10	10.9
Secondary	25	27.2
Polytechnic	11	12.0
University	40	43.5
Others	2	2.2
Occupation		
Student	13	14.1
Unemployed	13	14.1
Self employed	21	22.8
Employed (govt. or private org)	45	48.9

Table 2: Prevalence of posttraumatic stress disorder and depression compared between case and noncase

	RTA Control (%)	RTA Case (%)	X2	*P* Value
PTSD noncase ($N = 67$)	40 (87.0)	27 (58.7)	9.2	0.002
PTSD case ($N = 25$)	6 (13.0)	19 (41.3)		
MDD noncase (49)	32 (69.6)	17 (37.0)	9.8	0.002
MDD = Major Depressive Disorder case (43)	14 (30.4)	29 (63.0)		

MDD, Major Depressive Disorder ; PTSD, Posttraumatic stress disorder; RTA, road traffic accident.

Table 3: Sociodemographic variables compared for posttraumatic stress disorder case and noncase

Variable	Noncase	Case (PTSD)	Test of significance
Age			
1–20	2 (3.0)	0 (0.0)	t = 0.39
21–40	[39] (58.2)	[15] (60.0)	Df = 91
>41	[26] (38.8)	[10] (40.0)	$P = 0.91$
Mean (SD)	[40.2] (± 12.8)	39.9(± 12.0)	
Sex			$x^2 = 0.41$
Male [60]	[45] (75.0)	[15] (25.0)	Df = 1
Female [32]	[22] (68.8)	[10] (31.3)	$P = 0.52$
Marital status			
Single [37]	[26] (70.3)	11(29.7))	$x^2 = 3.56$
Married [48]	36(75.0)	12(25.0)	Df = 4
Separated/divorced [2]	[2] (100.0)	0(0.0)	$P = 0.468$
Widowed [6]	3(60.0)	2(40.0)	
Religion			$x^2 = 0.37$
Christianity [91]	66(72.5))	25(27.5)	Df = 1
Islam [1]	[1] (100.0)	0(0.0)	$P = 0.53$
Level of education			
No education [4]	4(100)	0(0.0)	$x^2 = 3.48$
Primary [10]	8(80.0)	2(20.0)	Df = 1
Secondary [26]	16(64.0)	9(36.0)	$P = 0.62$
Polytechnic [14]	8(72.7)	3(27.3)	
University [54]	29(72.5)	11(27.5)	
Others [2]	2(100.0)	0(0.0)	
Occupation			$x^2 = 1.341$
Student [13]	10(76.9)	3(23.1)	Df = 3
Unemployed[13]	[9] (69.2)	4(22.2)	$P = 0.85$
Self-employed[21]	14(66.7)	7(33.3)	
Employed govt or private org [45]	[34] (75.6)	11(24.4)	

Table 4: Sociodemographic variable compared for MDD case and noncase

Variable	Noncase	Case (MDD)	Test of significance
Age			
1–20	1 (2.0)	1 (2.3)	t = 0.76
21–40	[24] (49.0)	[30] (69.8)	df = 91
>41	[24] (49.0)	[12] (27.9)	$P = 0.26$
Mean (SD)	[41.5] (±12.8)	38.3(±12.2)	
Sex			$x^2 = 0.000$
Male [60]	[32] (53.3)	28(46.7)	Df = 1
Female [32]	17(53.1)	20(46.9)	$P = 0.98$
Marital status			$x^2 = 4.0$
Single [37]	20(54.1)	20(40.8)	Df = 3
Married [48]	26(54.2)	22(40.0)	$P = 0.26$
Separated/divorced [2]	2(100.0)	1(100.0)	
Widowed [5]	[1] (20.0)	1(25.0)	
Religion			$x^2 = 1.408$
Christianity [91]	49(53.8)	42(46.2)	Df = 1
Islam [1]	0(0.0)	1(100.0)	$P = 0.23$
Level of education			
No education [4]	[2] (50.0)	2(50.0)	$x^2 = 0.793$
Primary [10]	5(50.0)	5(50.0)	Df = 5
Secondary [25]	13(52.0)	12(48.0)	$P = 0.977$
Polytechnic [11]	[6] (54.5)	[5] (45.5)	
University [40]	22(55.5)	18(45.0)	
Others [2]	1(50.0)	1(50.0)	
Occupation			$x^2 = 2.134$
Student [13]	7(53.8)	6(46.2)	Df = 3
Unemployed[13]	9(69.2)	4(30.8)	$P = 0.66$
Self-employed[21]	10(47.6)	11(52.4)	
Employed (govt or private)[45]	23(51.1)	22(48.9)	

Overall, 20.7% (19) of the persons who were involved in RTAs past one year had a comorbidity of PTSD and Depressive disorder.

[Table 3] compares the sociodemographic characteristics of PTSD cases with noncases. The results show that the rate of PTSD among persons aged 21–40 years was 60% and was higher than the prevalence in the other age groups. This finding, however, was not statistically significant. The prevalence of PTSD among men was 25%, whereas that among women was 31.3%. This finding was not statistically significant. Other variables such as marital status, religion, level of education, and occupation did not have any statistically significant relationships to PTSD.

[Table 4] compares the sociodemographic characteristics of cases of depression with noncases. The rate of depression among persons aged 21–40 was 69.8% and was higher than that in the other age groups. This finding, however, was not statistically significant. Men had an, approximately, equal rate of depression as the women but this finding was also not statistically significant. Other variables such as marital status, religion, level of education, and occupation did not have any statistically significant relationships to depression.

Discussion

The prevalence of PTSD among survivors of RTAs was 41.3%. This was over three times the rate found among the controls. It was higher than the prevalence of 33.7% as reported by Kolawole *et al.*[14] and also higher than the 26.7% prevalence reported by Iteke *et al.*[15] It was, however, lower than that reported by Ajibade *et al.*[21] who found a prevalence of 51.1% among RTA survivors. The prevalence of PTSD reported in this study falls within the range defined by previous studies. The high prevalence may be due to our small sample size and nonstratification of our patients according to severity of injuries.

Depression was found to have a prevalence of 63.0% among cases. This was about twice the prevalence of depression

in controls. This was quite high compare to the prevalence of 36.7% reported by Kolawole *et al.*[14] It was also higher than the rate of 38.2% reported by Ajibade *et al.*[21] Other illness-related factors that were not taken into account such as severity of injury or recency of the trauma may account for this high prevalence. Again our small sample size could be contributory.

The female sex is known to be more at risk for PTSD. We found that women had a higher prevalence of PTSD compared with the men; 31.3% compared with 25%. Even though this finding was not statistically significant, it is in keeping with the findings by Iteke *et al.*,[15] who reported a prevalence of 38% among women and 21% among men. Kolawole *et al.*[14] also reported a higher prevalence among women.

Single patients were found to have a 29% prevalence of PTSD compared with 25% among the married patients. This finding was not statistically significant. However, it's in agreement with the finding by Kolawole *et al.*[14] who reported a higher prevalence of PTSD among unmarried RTA survivors. He was of the opinion that the support provided by the partners of married patients may cushion the effect of the trauma and lessen the likelihood of PTSD. He also suggested that single patients who have observable scars or other deformities, as a result of the RTA may be more psychologically affected, especially if it reduces their chances of getting married in the future.

The level of education was not significantly associated with PTSD. This is in agreement with Iteke *et al.*,[15] who also found no relationship. It is, however, contrary to the finding by Kolawole *et al.*[14] who found that patients with no formal education had higher rates of PTSD.

We did not find occupation to be associated with PTSD. This is in agreement with the findings of Kolawole *et al.*[14] Iteke *et al.*[15] on the contrary, found that PTSD was commoner among persons who were gainfully employed prior to the RTA.

Depression is universally known to be commoner among women.[9] We found an almost equal prevalence of depression among men and women. This is probably as a result of the small sample size of this study. This reason may also explain why other variables known to be related to depression such as marital status and occupation did not show any statistical significance.

Comorbidity of PTSD and depression was 20.7%. This was lower than the comorbidity of 48% reported by Blanchard *et al.*[12] and lower than the comorbidity of 43.2% reported by Shalev AY.[22] The factors that determine comorbidity are quite complex and may differ significantly in our sample compared with theirs. It is also important to note that these comparative values were not derived from local studies.

Limitations

The sample size was small and the study population is localized to a Tertiary Hospital, hence, there are limits to the generalization of the study. The nonexploration of the illness factors such as, physical disability and other accident-related factors, which may be associated with psychopathology in RTA victims is also an important limitation.

Conclusion

PTSD and depression are highly prevalent among survivors of RTAs. There is also significant comorbidity of both conditions among RTA survivors. If these conditions are left underdiagnosed and untreated, it may lead to worse health outcomes.

Recommendations

It is important for more research to be done on the subject with more data collected across the different states, with larger samples in order to get a more statistically accurate picture of both conditions among road traffic accident survivors. There is need to integrate a psychological screening tool to help in the detection of Posttraumatic stress disorder and depression in Trauma units. There is even a stronger need to introduce and optimize psychiatric liaison in trauma centers and units handling road traffic injury victims.

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Conflicts of interest
There are no conflicts of interest.

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