INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY HEALTH SCIENCES
ISSN: 2394 9406

Original research article:

Perceived Stress among Blood Donors who had Vasovagal Syncope

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ABSTRACT

Introduction: Syncope or simple faint which is by far the most frequent type of reaction to blood donations is a neurophysiologic response to blood loss and is supposedly aggravated by psychological factors like stress.

Aim: This study was designed to determine stress levels amongst the donors who fainted after blood donation

Methodology: A total of 50 donors who had syncope were included in the study. The global perceived stress scale (PSS) which consisted of 10 questions, was used as the screening instrument. Each of the 10 questions had five responses and the responses were scored 0-4. The total score was obtained by adding the scores of the individual response. A score of 20 was taken as cut off for categorizing the sample as stressed or not.

Results: Mean PSS score in the study population was 17.22(SD =4.39) with a median of 18 (IQR 16-19).Mean PSS score for female donors (n = 6) was 19.5 (SD 2.51) while the same for male donors (n = 44) was 16.91(SD=4.52). The median score for female donors was 16 whereas that for male donors was 18.

Key words: Vasovagal syncope, perceived stress, blood donors

INTRODUCTION

Syncope or simple faint is by far the most frequent type of reaction to blood donations[1]. Vasovagal syncope is usually described as a sudden and transient loss of consciousness that resolves spontaneously. Onset of (pre)syncope is preceded by a mismatch between oxygen demand and oxygen supply in the cerebrum[2]. Emotional arousal and psychologic uncertainty are conditions conducive to vasodepressor syncope. Under such circumstances there may be simultaneous activation of two emergency biologic regulatory systems, flight-fight and conservation-withdrawal. In the healthy person this may result in vasodepressor syncope, benign arrhythmias, or both[3]. This neurophysiologic response to blood loss is supposedly aggravated by psychological factors like stress. Stress can be defined as the body's non-specific response to any demand made on it. Stress can cause exhaustion and illness, either physical or psychological. So we designed this study to determine stress levels amongst the donors who fainted after blood donation.

METHODOLOGY

The present study was undertaken at Department of Transfusion Medicine and Immunohematology, at a tertiary level care Medical College Hospital in south India. The department collects around 2500 units of blood every month from both voluntary and replacement donors in the department as well as outdoor blood donation camps. A cross-sectional study over a period of 1 year was done using self-administered questionnaire to donors who had vasovagal reactions during or after donation before leaving the blood bank which is on an average 30 minutes from phlebotomy.

A total of 50 donors who had syncope who could read and comprehend English language were administered the perceived stress scale. The donors were made to understand the instructions and objectives of the study. Informed consent was taken from all the participants. The participants were assured of confidentiality of the information provided and had an option of refusal to participate in the survey. The data was analysed using Statistical Package for Social Sciences (SPSS) version 10. The mean score and frequency of responses of perceived stress were calculated.

Perceived stress (PSS)

Perceived stress was measured using the perceived stress scale, which comprised of 10 questions with responses varying from 0 to 4 for each item and ranging from never, almost never, sometimes, fairly often and very often respectively on the basis of their occurrence during one month prior to the survey. The PSS has an internal consistency of 0.85 (Cronbach α co-efficient) and test-retest reliability during a short retest interval (several days) of 0.85[4]. It assesses the degree to which participants evaluate their lives as being stressful during the past month. It does not tie appraisal to a particular situation; the scale is sensitive to the non-occurrence of events as well as ongoing life circumstances. PSS scores are obtained by reversing the scores on five positive items, for example 0 = 4, 1 = 3, 2 = 2, etc. and then summing across all 10 items. Items 4, 5, 6, 7 and 10 are the positively stated items. The scale yielded a single score with high scores indicating higher levels of

stress and lower levels indicating lower levels of stress. The PSS has a possible range of scores from 0 to 40. The range of PSS scores were divided into 2, upper and lower halves (20 being the operational cut off value) and were labeled as stressed and not stressed respectively. This cut off value was selected in accordance to a study from Egypt[5].

RESULTS

Demographic characteristics of the respondents

Out of 52 donors 50 completed and returned the questionnaire giving an overall response rate of 96.2%. The mean age was 25.3(SD = 1.09) with a range of 18-38 years. Forty four were males (88%) and 6 were females (12%). 16 of them were married of which 2 were females. Majority of them were students (70%) pursuing education at various stages either as diploma, undergraduate or post graduates. Rest of them was either self employed, or employed in either public or private sector.

Perceived stress

Mean PSS score in the study population was 17.22(SD =4.39) with a median of 18 (IQR 16-19).Mean PSS score for female donors (n = 6) was 19.5 (SD 2.51) while the same for male donors (n = 44) was 16.91(SD=4.52). The median score for female donors was 16 whereas that for male donors was 18. The 10-question survey instrument's sample response frequencies are given (Table 1).

DISCUSSION

The pathophysiology of VVR is incompletely understood. Current thinking is that peripheral baroreceptor activity in the donor plays a central role. These receptors may be influenced by factors including age, blood pressure, and emotional state[6]. After a preceding period of increased nerve activity, onset of syncope is associated with bradycardia and sudden cessation of sympathetic outflow. Neurally mediated muscular vasodilatation occurring during syncope is due to inhibition of vasoconstrictor impulses. Perry S.J. Adler conducted a study in which baroreflex sensitivity at rest and during stress in individuals with a history of vasovagal syncope was assessed and it was found that in individuals with a history of vasovagal reactions displayed greater baroreflex sensitivity during the pain stimulus and at rest, but not during mental arithmetic. These findings suggest one mechanism of risk for syncope reactions, particularly in situations involving the experience of pain[7]. And It is also been said that resting muscle sympathetic activity is altered in patients who displayed vasovagal syncope[8,9]**.** Other possible mechanism include release of endogenous opioids or nitric oxide that may inhibit sympathetic nerve firing, and primary central nervous system activation (as in partial seizures) that triggers cardio inhibitory and vasodepressor responses[10]. However, there seems to be a critical level of cardiac output, about half the supine level, when the normal control is interrupted and instead of vasoconstriction and tachycardia the efferent autonomic control switches to vasodilation and bradycardia. A similar pattern of autonomic responses may also occur in susceptible individuals in response to emotional or painful stimuli—for example, during venipuncture. The emotional (or painful) stimuli and the effects of

orthostasis seem to interact and there is a much higher incidence of syncope during head-up tilting in individuals with indwelling venous catheters[11].

Our study showed that 34% of the donors who had syncope were actually stressed according to the score on perceived stress scale which evaluates stress levels in the donor in the past one month. There was no much difference with regard to sex either, as it was 33.33% among females and 34.1% among males. Andreou et al have commented on their study conducted in Greece among general population that perceived stress scale revealed a positive score among 38.6% of their respondents[12]. A study done on medical students in Mangalore, India had revealed a positive stress score amongst 42.5% participants[13]. There are studies which say that perceived stress is more among females in comparison to males as women are more likely to express their perceptions of stress[14].

Stress is variedly described as the perceived or actual threat on physical or psychological homeostasis of the human body. When homeostasis of the body is disrupted it leads to activation of various central and peripheral neuroendocrine mechanisms leading on to adaptive behaviors and responses. Stress can act as a creative force that increases drive and energy, but once it reaches a certain degree, the results can be negative. In the absence of gold standard measurement for stress, one of the popular methods in assessing the perceived stress of an individual is through questionnaire. Since the questionnaire was self administered, interpretation of the questions, inaccuracies in response, perception and reporting of emotions by the respondents do affect the outcome of the score. However this method has been validated in various studies. Also as the questionnaire inquires into the events of past one month it would not actually be direct repercussion on the day of donation.

CONCLUSION

This study shows that the donors had no higher perceived stress score compared to general population and hence would suggest that the acute stress due to various emotions and events triggering anxiety like fear of needle, blood hostility of the collection staff etc that happen before and during donation would be more important in causing vasovagal reactions than the events and emotional status of past one month.

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Table 1: Profile of stressed donors

Criteria	Stressed	Not stressed	Total
Sex			
Male	15	29	44
Female	2	4	6
Marital status			
Married	5	10	15
Unmarried	12	23	35
Age			
18-24	2	22	24
25-34	9	10	19
35 and more	6	1	7

Table 2: Donor's responses to perceived stress scale in number and percentage

No.	STATEMENT	NEVER	ALMOST NEVER	SOMETIMES	OFTEN	VERY OFTEN
		Number Of Responses (%)				
1	In the last month, how often have you been upset because of something that happened unexpectedly?	21 (42%)	11 (22%)	15 (30%)	3 (6%)	0
2	In the last month, how often have you felt that you were unable to control the important things in your life?	24 (48%)	9 (18%)	10 (20%)	6 (12%)	1 (2%)
3	In the last month, how often have you felt nervous and "stressed"?	18 (36%)	2 (4%)	22 (44%)	6 (12%)	2 (4%)
4	In the last month, how often have you dealt successfully with day to day problems and annoyances?	12 (24%)	4 (8%)	13 (26%)	18 (36%)	3 (6%)

5	In the last month, how often have you felt that you were effectively coping with important changes that were occurring in your life?	15 (30%)	11 (22%)	10 (20%)	11 (22%)	3 (6%)
6	In the last month, how often have you felt that things were going your way?	11 (22%)	6 (12%)	14 (28%)	15 (30%)	4 (8%)
7	In the last month, how often have you been able to control irritations in your life?	9 (18%)	5 (10%)	13 (26%)	20 (40%)	3 (6%)
8	In the last month, how often have you been angered because of things that happened, that were outside of your control?	11 (22%)	10 (20%)	19 (38%)	5 (10%)	5 (10%)
9	In the last month, how often have you found yourself thinking about things that you have to accomplish?	10 (20%)	5 (10%)	15 (30%)	17 (34%)	3 (6%)
10	In the last month, how often have you been able to control the way you spend your time?	6 (12%)	6 (12%)	14 (28%)	20 (40%)	4 (8%)