

ORIGINAL ARTICLES**PSYCHIATRIC MORBIDITY AMONGST
THE TROOPS DEPLOYED AT SIACHEN****Khalid Bashir**

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ABSTRACT

Objectives: To compare the psychiatric morbidity in acclimatized “deployed” troops with acclimatized but “not yet deployed” troops and to find out the usefulness of General Health Questionnaire – 12, as a screening tool to identify psychiatric morbidity in troops at high altitudes.

Study Design: Comparative study.

Duration and Place: The study was conducted at Siachen from June to July 1996.

Patients and Methods: The study population (n= 245) was divided into two groups. Group I (n=126) comprised of troops acclimatized and trained for 07 weeks below 14000 feet by staged and graded ascent but were “not yet deployed”, and Group II (n=119) comprised of acclimatized troops who remained “deployed” above 15000 feet for an average duration of 07 weeks, and had descended to a mean height of 14200 feet, in previous two - three weeks. General Health Questionnaire – 12 and Present State Examination were used for psychiatric evaluation.

Results: Out of 245 troops exposed to high altitude, 105 (42.8%), had psychiatric morbidity, as measured by a score of more than 2 on General Health Questionnaire -12 and a positive International Classification of Diseases – 10 diagnosed on clinical psychiatric interview based on Present State Examination. More troops 67 (56.3%), in Group II had psychiatric morbidity as compared to Group I, 38 (30.2%). Psychotic symptoms; delusions 2 (1.68%) and hallucinations 3 (2.52%) were seen in Group II patients whereas no psychotic symptoms were seen in Group I. The psychotic symptoms resolved completely after descending to 14200 feet but the neurotic symptoms, did not resolve completely. Cases, scoring 2/12 or above (42.8%) on General Health Questionnaire -12 were highly associated with a positive psychiatric diagnosis. The sensitivity, specificity and Positive Predictive Value and Negative Predictive Value of GHQ-12 in group I was 100%, 91%, 82.6% and 100%; whereas in group II it was 100%, 98.1%, 98.5% and 100% respectively.

Conclusion: High altitude “deployment” is stressful for troops and is associated with development of “psychotic and “neurotic” symptoms above 15000 feet. The “psychotic” symptoms abate completely but some “neurotic” symptoms persist even after descent to 14200 feet. General Health Questionnaire – 12 followed by psychiatric interview can effectively determine psychiatric morbidity in troops deployed at high altitudes.

Keywords: Deployed troops, psychological symptoms, high altitude.

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INTRODUCTION

Hypobaric hypoxia lowers the oxygen supply to the body, predisposing to altitude illnesses, and reduced physical and mental performance. Acclimatization allows troops to achieve the maximum physical work performance at "high altitude" (8,000 -14,000 feet) and at "very high altitudes" (above 15000 feet). There are two methods to achieve acclimatization: Staged Ascent, requires troops to ascend (rise) to a moderate altitude and remain there for 3 days or more before ascending higher. Graded Ascent, requires troops to spend two nights at 9,000 feet and ascend 1,000 feet per day above the previous night's sleeping altitude [1]. Training below 14000 feet reduces the impact of some of the height effects; therefore Pakistan Army acclimatizes troops for average duration of 07 weeks by both staged and graded ascent [2].

In high altitude combat "deployed troops" are subjected to extreme cold, intense ultraviolet radiation, strong winds, blizzards, avalanches, rockslides, heavy fog and unpredictable weather. Physical conditions become more dangerous than enemy fire, and logistics demands are considerably higher. Front-line combatants need daily supplies of ammunition, food, water, and heat for survival. A battalion task force tries to carry and stockpile enough supplies to operate for 1 to 2 weeks. The "deployed troops" live in shelters, made of portable fiberglass. Living conditions are dark and dingy and unventilated. Kerosene stoves are used for shelter heating. Troops breathe air, mixed with thick soot, which compounded by restricted movement, little or no recreation and monotonous routines in the background

of freezing temperatures, predisposes them to develop psychiatric morbidity [3].

At 10000 to 14000 feet, many soldiers only experience feelings of diminished vigor, weariness, and increased sleepiness. However, clear psychiatric morbidity reflected as hostile behavior changes, thoughts of paranoia, depression, anxiety and obsessive-compulsiveness are more commonly observed at heights above 15000 feet [4]. High Altitude Medical Research Cell (HALMARC) studied psychiatric sequelae on high altitude exposure in soldiers deputed in Siachen area and observed that psycho-neurological changes were detected in "non-acclimatized" lowlanders after 96 hours ascent from 7600 feet to 14200 feet but cleared completely within 48 hours [5]. In another study climbing at high altitudes was associated with high incidence of hallucinatory experiences (visual and auditory), above 18000 feet as compared to below 18000 feet [6].

The commonest altitude related medical illness is Acute Mountain Sickness (AMS) associated with headache, nausea, vomiting, dyspnoea, and insomnia which also have a psychological basis [7]. At high altitudes it becomes difficult to demarcate physical from psychological symptoms [8, 9], necessitating to study the psychological symptoms in more detail. It is useful to remember a common rule that acute onset of symptoms are more likely to be organic or due to direct physical effects of height and chronic symptoms are more likely to have a psychological basis. Therefore the symptoms which fail to resolve spontaneously after a few days / weeks reflect true psychiatric morbidity and it necessitated to study if the altitude related symptoms abated after descent to lower altitudes.

This study was carried out to find out the psychiatric morbidity in acclimatized troops, "deployed", i.e. exposed to extreme weather and engaged in active battle, above 15000 feet for an average duration of 07 weeks as compared to troops who only underwent "high altitude training" and acclimatization for 07 weeks below 14000 feet by staged and graded ascent but who were "not yet deployed" i.e. not yet exposed to extreme weather and battle conditions. This study also addressed whether the altitude related symptoms abated in troops after descending to a height of 14200 feet and to find out the usefulness of GHQ - 12, to screen troops having psychiatric morbidity at high altitudes.

PATIENTS AND METHODS

Study Design:

Comparative study

Duration and Place:

This study was conducted at Siachen from June to July 1996.

Sample Size and Setting:

Two hundred and forty five male acclimatized troops in Siachen area were enrolled.

Inclusion/Exclusion Criteria:

Troops within age group of 18 to 42 years and not having any chronic medical or surgical illness were included in the study. Individuals taking medicines for any condition were excluded from the study.

Instruments Used for Psychiatric Screening:

- GHQ - 12 (General Health Questionnaire - 12) by Goldberg 1972 [10].

- GHQ - 12, Urdu Version by Minhas & Mubbashar 1996 [11].

Instruments Used for Psychiatric Diagnosis:

- P.S.E (Present State Examination) by Wing et al [12, 13].
- I.C.D -10 (International Classification of Diseases by WHO 1992) [14].

Study Design:

The study population (n= 245) was divided into two groups. Group I (n=126) comprised of troops acclimatized for 07 weeks below 14000 feet by staged and graded ascent, and Group II (n=119) comprised of acclimatized troops who remained "deployed" above 15000 feet, for an average duration of 07 weeks and had returned to battalion headquarters (mean height - 14200 feet), in previous two to three weeks. The screening of troops and data collection was done at a mean height of 14200 feet, in three steps one after the other:

- Step - I: Both groups were screened using GHQ - 12 (Urdu Version), for possible psychiatric morbidity.
- Step - II: All patients of both groups had a psychiatric interview based on PSE. A positive diagnosis of psychiatric morbidity was taken as "Gold Standard". The original 140 items described in the full scale were kept in mind while framing questions tailored to elicit symptoms of anxiety, depression and psychosis. The final diagnosis in both the groups was reached using diagnostic criteria of ICD -10.
- Step - III: All troops in (Group I and Group II), were asked to enlist the symptoms which they experienced during the preceding few weeks of

training / acclimatization or deployment at high altitude.

An informed consent for inclusion in the study was obtained from all the participants. All queries were translated in the Urdu language for better understanding of participants.

STATISTICAL ANALYSIS

The data was analyzed using SPSS ver 8.0. Descriptive statistics i.e mean + SD and percentages were used to describe the data. Independent samples t-test was used to compare age between both the groups. Chi-square test was used to compare the categorical variables between both the groups and to check the association between categorical variables. To check the usefulness of GHQ-12 sensitivity, specificity, positive predictive value and negative predictive value.

RESULTS

Results were available for all 245 individuals. Mean age in group I was 26.91 (SD = 7.88) and in group II was 26.79 (SD 7.90) (p > 0.005),. There was insignificant difference in past psychiatric history and presence of psychiatric illness in family between both the groups (p>0.05) psychiatric morbidity was significantly associated with past and family psychiatric histories in both the groups (table-1).

Psychiatric morbidity was diagnosed on the basis of PSE and ICD-10. A GHQ -12 score of 2 or more with a psychiatric morbidity was taken as true positive and a GHQ -12 score of 2 or more without psychiatric morbidity was taken as false positive. In 131(52.8%) cases the GHQ score was 1/12 and no psychiatric diagnosis was established. In 9(3.6%) the GHQ score was 2/12, but no psychiatric diagnosis was established and they turned out to be false positives. In the remaining

105(42.3%), the GHQ Score was 2/12 to 12/12 and a positive psychiatric diagnosis was established. The Sensitivity, Specificity, Positive Predictive Value and Negative Predictive Value of GHQ-12 in group-I and group-II (table-2).

The psychiatric morbidity was 30.2% cases in group I and in 56.3% cases in group II (p < 0.005). The psychiatric diagnosis in group I was: Depressive episode (F 32) in 24(19.0%), anxiety disorder (F 41) in 9(7.1%), obsessive-compulsive disorder (F 42) in 4(3.2%) and psychosis (F 23) in 1(0.8%). In Group II the psychiatric diagnoses were: Depressive episode (F 32) in 45(37.8%), anxiety disorder (F 41) in 14(11.80%), obsessive compulsive disorder (F 42) in 5(4.2%) and psychosis (F 23) in 3(2.5%), (fig. 1).

The frequency of neurotic symptoms experienced by troops in Group I was: headache 48(38.1%), loss of appetite 42(33.3%), reduced sleep 37(29.4%), depressed mood 35(27.8%), memory lapses 33(26.2%), health worries 29(23%), easy fatigue ability 28(22.2%) and irritability 21(16.7%). In Group

Table-1: Past and family psychiatric history.

	Psychiatric Morbidity		P-Values
	No	Yes	
Group-I (n=119)			
Past Psychiatric History	1	4	0.004
Family Psychiatric History	1	5	0.003
Group-II (n=126)			
Past Psychiatric History	1	13	0.004
Family Psychiatric History	1	14	0.002

Table-2: Usefulness of GHQ-12 as a screening tool.

	Group-I	Group-II
True Positive	38	67
False Positive	8	1
True Negative	80	51
False Negative	0	0
Sensitivity	100%	100%
Specificity	91%	98.1%
Positive Predictive Value	82.6%	98.5%

II most prominent symptoms were headache 71(59.7%), reduced appetite 65(54.6%), depressed mood 56 (47%), inability to concentrate 52 (43.7%), reduced sleep 48(40.3%), recent lapses in memory 47(39.5%), Irritability 47(3.9%), easy fatigue ability 45(37.8%), health worries 39(32.8%), palpitation 32(26.9%). Psychotic symptoms were delusions 2 (1.68%), auditory hallucinations 3(2.5%) and visual hallucinations 1(0.8%) (fig. 2).

DISCUSSION

In this study the overall psychiatric morbidity amongst troops at Siachen was 105/245 (42.3%). The psychiatric morbidity in troops “deployed” above 15000 feet (Group II) for an average duration of 7 weeks, was

much higher 67/119 (56.3%), as compared to 38/126 (30.2%) in troops of Group I, who were acclimatized below 14000 feet for 7 weeks but were “not yet deployed”. These figures are similar to the earlier study on deployed troops [5], and indicate that the environment at high altitudes is more stressful so as to be causative in development of psychiatric morbidity.

In Group I, the percentage of depression was 19%, but in Group II, percentage of depression was almost double (37.8%), similar to earlier observation [5]. The percentage of anxiety in troops of Group II is also higher (11.8%) as compared to Group I (7.1%). The percentage of OCD (3-4.5%) and delusional disorder (0.5 – 2.5%) in both groups is similar, possibly because for both conditions genetic

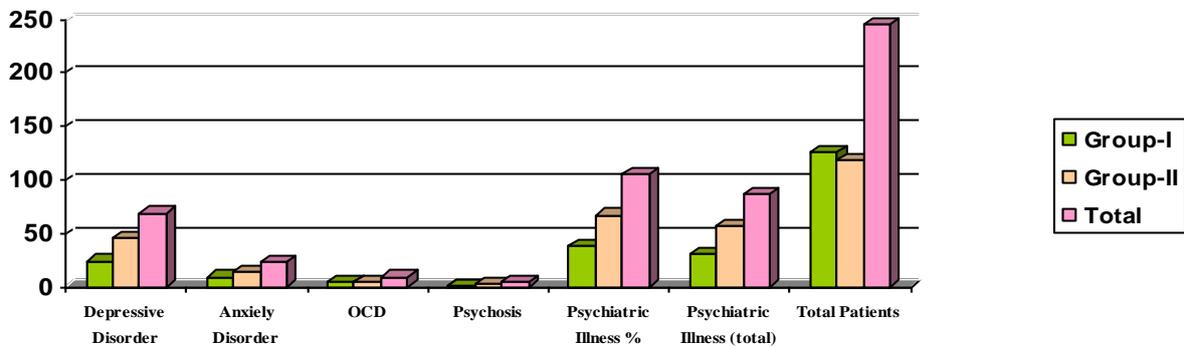


Fig. 1: Psychiatric diagnoses in groups-I&II:

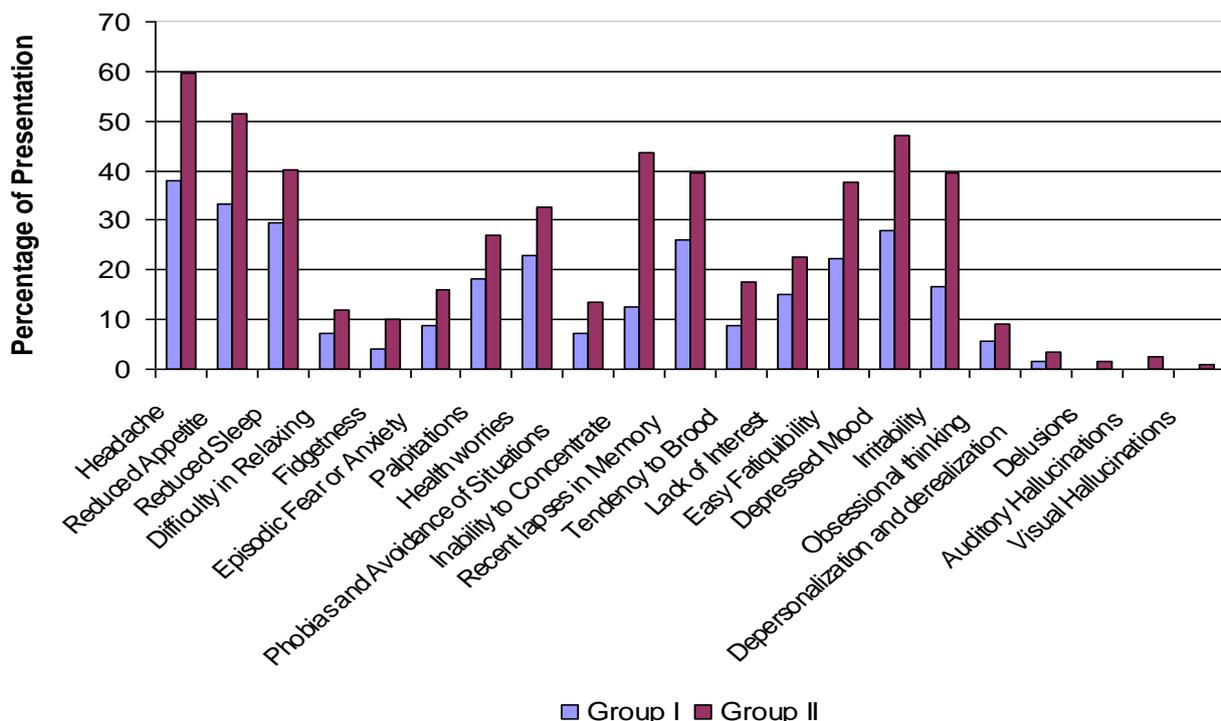


Fig. 2: Psychological symptoms (groups-I&II).

make up and personality traits are more important in their development and maintenance. Similar high percentage of anxiety, depression and OCD amongst deployed soldiers has been reported in several other studies [4, 5 and 6].

The most commonly occurring neurotic symptoms in both the groups (fig. 2) were: headache, reduced appetite, sleep disturbance, irritability, health worries, fidgetiness, episodes of fear, palpitations, phobias, obsessional thinking, tendency to avoid situations and inability to concentrate. However as expected troops in Group II have significantly higher percentages for all the variables and symptoms like depressed mood, tendency to brood, delusions and hallucinations were more commonly seen in Group II. Psychotic symptoms, delusions 2(1.68%) and hallucinations 3(2.52%) were seen only in Group II patients whereas no psychotic symptoms were seen in Group I. The number of psychotic symptoms in present study are much less as compared to the earlier work in "acclimatized" lowlanders, where the frequency of psychotic manifestation was much more at extreme altitudes (19,617 feet), but they cleared up after descent to 14,200 feet within 48 hours with no lasting evidence of psychological deficits [5]. One possible reason may be that at the time of interview in the present study, most of the troops had descended from active deployment to 14200 feet altitude, two to three weeks ago. However the results of present study are similar to another study of extreme altitude climbers, when hallucinatory experiences (visual and auditory) were found to be less at high altitudes below 18000 feet as compared to extreme altitudes [6].

The neurotic symptoms observed in this study are much more resistant to spontaneous remission and were measurable even after two weeks of descent to 14200 feet. The

reason for persistence of symptoms in this study could be that the troops remained "deployed" above 15000 feet for more period (07 weeks) and possibly were exposed to high altitude environment for a longer period of time. This finding differs from the earlier observation that neurotic manifestations which appear at extreme altitudes, clear up completely after a descent of 14200 feet within 48 hours with no lasting evidence of psychological deficits [5].

One reason often suggested for increased neurotic symptoms, in previous studies was apprehensions about difficult terrain, and adverse living and weather conditions [5, 6]. Moreover it was also observed earlier that the longer a person stays at high altitude the more symptomatic he becomes and the chances of his developing neurotic or psychotic illness also increase [15]. Another probable reason cited is disturbance of melatonin secretions and circadian rhythms because of reduced sunlight and indoor living conditions leading to negative mood changes as well as defects in memory, concentration and other vital functions of the body [16]. Other studies point at factors like nutritional deficiencies, fluid and electrolyte balance which can all be sufficiently stressful to produce or maintain neurotic symptoms [17]. Finally, a lot is talked about the genetic make up of an individual predisposing some troops to develop psychiatric morbidity. In Group II troops, it is seen that 13/67 (19.4%) had a past history of psychiatric illness and 14/67(20.9%) had a positive family of psychiatric illness as compared to Group I in which 4/38(10.5%) had positive past history of psychiatric illness and 5/38(13.2%) had family history of psychiatric illness. In both the groups psychiatric morbidity was significantly associated with positive past history and family history of psychiatric illness, therefore on the basis of these results it can be assumed

that the high percentage of psychiatric morbidity and a positive past and family history of psychiatric illness may be the missing link, highlighting the importance of genetic predisposition and susceptibility towards psychiatric morbidity.

In this study the use of simple screening instrument (GHQ – 12) followed by psychiatric interview based on PSE, has effectively detected psychiatric morbidity at a cut of point of 2. The Sensitivity, Specificity, Positive Predictive Value and negative predictive value of GHQ-12 in group I was 100%, 91%, 82.6%; whereas in group II it was 100%, 98.08, 98.53% and 100% respectively (table-2). This finding is consistent with the study in primary care setting of Pakistan, to determine psychiatric morbidity, and reliability of GHQ – 12 as a screening tool [11].

CONCLUSION

The present work reveals that “deployment” of troops at high altitudes is associated with increased psychiatric morbidity as compared to acclimatization alone at lower altitudes. The psychotic symptoms resolve completely after descending to mean altitude of 14200 feet but the neurotic symptoms persist even after 2-3 weeks. More number of troops having a past or family psychiatric history in group II, stresses upon the need to screen this group of individuals before deployment. The high sensitivity and specificity of GHQ -12 in identification of psychiatric morbidity, makes it a useful tool and should be used to identify individuals who are vulnerable to develop psychiatric morbidity on high altitude exposure.

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