MORBIDITY PROFILE OF RECRUITS DURING BASIC MILITARY TRAINING

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ABSTRACT

Objective: Objective of this study is to find the leading causes of morbidity among recruits during their basic military training so that effective preventive measures can be adopted.

Study Design: Cross sectional descriptive study.

Duration of study: Jan 2010 to Dec 2010.

Subjects and Methods: All recruits belonging to one training centre who were admitted in the hospital for any disease were included in the study. The record of these admitted recruits was obtained from admission books containing information about diagnosis, date of admission / discharge and disposal on discharge. During this one year all recruits who underwent training in the centre were used as denominator for calculating the rates.

Results: Out of total nine thousand four hundred and ninety one recruits, 696 (7.3%) were admitted in hospital. Out of 696 hospital admissions, 391 (56.2%) and 305 (43.8%) recruits were admitted with medical and surgical diseases respectively. Training related injuries (207), chicken pox (110) and fever of fever unspecified (FUO) (102) were the main reasons for morbidity and temporary disability in recruits. On average 17.12 training days were lost by each hospitalized recruit because of hospital stay and sick leave. The frequency of invalidment was 0.6321 per 1000 recruits.

Conclusion: The study revealed that the major causes of morbidity were training related injuries, infectious/parasitic diseases and fever FUO. There is a need to adopt preventive measures to reduce the incidence of training related injuries and construction of more accommodation to avoid overcrowding to reduce the incidence of infectious diseases.

Keywords: Disease, Morbidity, Recruit, Training injuries.

INTRODUCTION

The prevention of disease and the promotion of health among its personnel is one of the most important activities of an army. It is ensured during the selection of recruits in army that individuals are free of medical diseases, physical defects and psychiatric illnesses so that they are capable of completing basic military training. In spite of best physically selected individuals, these recruits during their basic military training suffer from a number of diseases resulting in hospitalization. A number of factors contribute to increased hospitalization amongst recruits. For example, these recruits come from all over the country within short span of time bringing with them varying disease exposures and live together in close proximity leading to outbreaks of communicable diseases. In addition, there is mandatory training related exercises for which some individuals are not prepared resulting in injuries. Hospital admissions result in lost training time, disruption of training schedules, increased health care expenditures, permanent disability leading to invalidment [1].

No data is available regarding major causes of morbidity amongst recruits during basic military training in Pakistan. The present study was conducted with the aim to determine the leading causes of morbidity among recruits so that effective preventive measures can be adopted to avoid these diseases.

MATERIAL AND METHODS

This cross sectional descriptive study was conducted from 01 Jan 2010 to 30 Dec 2010. All recruits belonging to one training centre who were admitted to the hospital for any cause were

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Table-1: Distribution of surgical diseases amongst hospitalized recruits (n=305).

Surgical diseases	No. of patients
Training related injuries/disorders (n=207)	
Fractures	64 (20.9%)
Stress fractures	23 (7.5%)
Dislocation sprain & strain of joints	15 (4.9%)
Injuries / Trauma	35 (11.5%)
Abscess / Infected wound/cellulitis	45 (14.8%)
Backache	10 (3.3%)
Trauma nose	10 (3.3%)
Trauma eye	5 (1.6%)
Non-training related injuries/diseases (n=98)	
Acute appendicitis	10 (3.3%)
Renal colic / UTI	18 (5.9%)
Abscess of anal & rectal regions	08 (2.6%)
Others	62 (20.3%)

Table-2: Distribution of medical diseases amongst hospitalized recruits (n=391).

Medical Diseases	No. of patients
Infectious & parasitic diseases	176(45.0%)
Diseases of blood & blood forming organs	5 (1.3%)
Mental & behavioral disorders	8 (2.0%)
Disease of nervous system	6 (1.5%)
Disease of circulatory system	9 (2.3%)
Disease of respiratory system	29 (7.4%)
Disease of digestive system	20 (5.1%)
Disease of skin & subcutaneous system	31 (7.9%)
Disease of genitourinary disorders	5 (1.3%)
Symptoms, signs not classified elsewhere (Pyrexia FUO)	102 (26.1%)

included in the study. Admission books were maintained of all admissions to the hospital in each ward and ward master office. Both sources of admission record were used and cross checking between them was carried out to ensure accuracy. Complete data including diagnosis, date of admission, discharge and disposal on discharge was noted. Disposal was classified as a return to the unit, sick leave, invalidment or death. During this one year all recruits who were undergoing training in the centre were used as denominator for calculating the rates. Three courses underwent training from 1st Jan 2010 to 30th Dec 2010 for nine months basic military training. Course- 1 was doing training in Jan 2010 and passed out in Jul 2010. Course-2 and 3 were inducted in May 2010 and Oct 2010 respectively.

Analysis were primarily descriptive and disease incidence was calculated by dividing the number of recruits with that particular disease (nominator) by the total number of recruits (denominator) and expressed as a percentage. All statistical analysis was performed using SPSS software, version 16.0. Descriptive statistics were used to describe results.

RESULTS

During the study period, a total 9491 recruits underwent basic military training. The mean age of recruits was 20.1 years, with a range of 18 to 21 years.

Out of 9491, 696 (7.3%) recruits were hospitalized. Major causes of hospital admissions of 305 recruits in surgical ward are shown in Table-1. Out of 305, 207 (67.9%) surgical admissions were training related injuries as fractures, dislocations, trauma etc. Out of 23 ENT admissions, 10 cases were of trauma nose due to boxing. Similarly out of 10 eye admissions, 5 were of trauma. Out of 98 (32.1%) non training related surgical diseases, pain abdomen, renal colic and acute appendicitis, acute pharyngitis and vision problems were the main causes for admissions.

Table-2 shows admissions of 391 recruits with medical related diseases. Out of these 391 medical admissions, 176 (45.0%) recruits were admitted due to infectious and parasitic diseases. Chicken pox 110 (28.1%) was the main communicable disease causing morbidity amongst recruits. Other common infectious / parasitic diseases were malaria, pulmonary tuberculosis and viral hepatitis. Fever unspecified/ pyrexia FUO 102 (26.1%), skin diseases 31 (7.9%) and respiratory diseases 29 (7.4%) were other major causes of hospitalization of recruits in medical and allied wards.

Average hospital stay and sick leave period of different wards is shown in Table-3. Thirty three recruits were transferred to tertiary care hospitals and their hospital stay in tertiary care hospitals and sick leave details have not been included in the data. Each recruit suffering from tuberculosis was admitted for about three months and 23 days of training were lost by each recruit admitted due to chicken pox. The frequency of invalidment was 0.6321 per 1000 recruits.

Table-3: Average hospital stay and sick leave period in days of different wards (n=696).

Ward	Average of hospital stay (days)	Average sick leave (days)	Average training lost (days)
Surgical	5.36	12.36	17.72
Medical	5.60	4.02	9.62
Isolation	8.54	14.46	23.00
Skin	9.16	10.03	19.19
Psychiatry	11.88	-	11.88
TB	99.50	-	99.5
ENT	4.30	4.02	8.32
Eye	7.20	2.90	10.1

DISCUSSION

Recruit medicine has become a separate specialty of military medicine that deals with the medical care and treatment of recruits. It helps in selection of physically and mentally fit individuals to undergo rigorous basic military training. It also assists in the assessment, prevention, clinical management, and treatment of diseases and injuries peculiar to recruits and military training[2].

In present study the annual incidence of hospital admission of recruits was 7.3%. The admission rate of recruits in each month varied from 0.904% to 2.292% with mean 1.292%.

Out of 305 surgical admissions, 207 (67.9%) training related injuries and disorders and 98 (32.1%) non training related diseases were the main reasons for morbidity and temporary disability in recruits. From a total of 64 (20.9%) cases of fractures, the majority were of lower limbs. Similarly lower limbs cases of blisters, cellulitis, boils, infected wounds and sprains were more as compared to other sites. Other studies have also identified the lower limb as the area most affected by injuries in military recruits. The finding is also comparable to the findings in the Norwegian Defence Forces 63%, Irish Army (71%) and U.S. Army (80%)[3,4,5]. Fractures resulted in the largest proportion of training day wastage because each recruit with fracture was given 4 weeks sick leave in addition to 3-15 days hospital admission. Forty five (14.8%) recruits were admitted with cellulitis, blisters and abscesses. A study revealed that 78% of the men in Army training were having either blisters or cellulites in the first four weeks of training and their average hospital stay was 6.4 days[6]. Twenty three recruits (7.5%) sustained stress fractures and most commonly involved bones were tibia (15 cases), followed by metatarsal bones (4 cases), fibula (3 cases) and femur. Stress fractures are known to be endemic among recruits during basic military training and its incidence amongst recruits during basic military training in other studies has been reported from 1.4% to 20%[7,8]. The increased amount of weight bearing physical activity is the main reason of stress fracture among recruits and first three weeks of the training are the most likely weeks in which stress

fractures occur[9]. Risk may be reduced by high intakes of calcium, vitamin D, and possibly protein (e.g., milk products). Gradual weight bearing exercises can also reduce the risk of stress fracture[10].

Out of 391 medical admissions, 176 (45.0%) were of infectious/parasitic diseases. Chicken pox was the most frequent 102 (26.1%) infectious diseases followed by malaria 20 (5.1%), pulmonary tuberculosis 16 (4.1%) and viral hepatitis 10 (2.6%). The overall frequency of chicken pox among total 9491 recruits was 1.158%. Maximum cases of chicken pox were admitted when there was an overlap of two courses i.e. overcrowding. Its frequency varied from 0.558 /1000 recruits in March to 3.654 /1000 in June. A study from India has reported an incidence of 24.32 per 1000 recruits from three training centres[11]. Generally it is considered a serious disease in adults but a study from Pakistan revealed that unlike in the west, adult patients in Pakistan had a mild/moderate disease which settled with symptomatic treatment[12]. In our study also the severity of the chicken pox was mild/moderate,Varicella screening and vaccination has been suggested as a preventive measure to reduce the incidence of this disease amongst recruits[13]. We should carry out a study to evaluate its cost effectiveness. It is clear that maximum number of cases occurred when there was overcrowding due to overlapping of two courses and it is known fact airborne diseases spread at overcrowded barracks[14].

Out of 31 admissions in skin ward, 18 were of infected scabies followed by eczema. In a study 5% deployed US military personnel reported one or more skin and soft tissue infection during their most recent employment[15]. In our study 29 (7.4%) recruits were admitted with respiratory tract diseases. A study revealed that almost 90% of all military recruits report symptoms of respiratory illness at some point in their first months of basic training. Although most cases of illness are mild and treated in the outpatient setting, hospitalizations for pneumonia and other complications are not uncommon[16]. The crowded, close-contact training environment may facilitate transmission of pathogens[17]. Sixteen recruits were admitted in TB ward, 6 were having service less than four months and they were invalided out of the army on administration ground, 8 were treated in the hospital for about three months and placed in medical category "CEE" for six months and 2 were invalided out of service on medical grounds. The prevalence of latent TB infection from 1.6% to 3.5% has been reported among US Navy and Marine recruits[18,19]. Out of 8 recruits admitted in psychiatry ward, 3 were having dissociative (conversion) disorders and 2 were suffering from severe depression. Four recruits were transferred to tertiary care set up for further evaluation and remaining four were returned to units. A 29.9% frequency of depressive symptoms among newly recruited young adult men in the Turkish army has been reported. The higher frequency of mental disorders among recruits may reflect problems in adapting to an environment that is significantly different from their previous lives in terms of environmental factors and lifestyle, and that had strict disciplinary rules and a heavy physical workload[20].

Important 11 out of 351 training days of admitted recruits were lost because of hospital stay and sick leave. Recruits suffering from tuberculosis remained hospitalized for about three months. On average each hospitalized recruit lost 17.12 training days. Six recruits were invalided out of the service due to diseases / injuries related to training or which manifested during training. Invalidment rate was 0.6321/1000 recruits.

CONCLUSION

The study revealed that the major causes of morbidity among recruits during basic military training were training related injuries and infectious/parasitic diseases causing loss of valuable training work days. Such studies must

be conducted at larger scale so that appropriate strategies could be adopted to prevent these avoidable training related injuries and other communicable diseases.

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