

## SEA SICKNESS IN NAVAL PERSONNEL

Malek MA<sup>1</sup>, Maruf AA<sup>2</sup>, Hossain MM<sup>3</sup>**Abstract**

Seasickness can be a debilitating condition and can be dangerous if the naval personnel appointed in operational or key appointment in the ship during operation. The objective of this descriptive study was to report and evaluate the incidence, severity and effects of seasickness among naval personnel of Khulna Naval Base. The study was conducted over a period of 18 months. This study included 1293 healthy male sailors and aged ranges between 20 to 45 years. Data included sailor's demographics, duration at sea, types of symptoms, severity of seasickness, incidence of seasickness in relation to exposure, and sea condition. Total 785 (60.71%) sailors stayed less than 7 days, 311 (24.06%) from 7 to 14 days and 197 (15.23%) stayed more than 14 days. Total 523 (40.44%) sailors experienced seasickness; those were dizziness (18.32%), fatigue (17.09%), vertigo (11.36%), epigastric discomfort (9.74%), nausea (17.40%) and vomiting (6.57%). Majority were minor inconvenience, self limiting and did not require rest (78.78%). Excuse from duty for 24 hours was required in 101 (19.31%) cases and excused from duty for whole sea period in 10 (1.91%) cases. Incidence of seasickness observed in first exposure in 275 (52.59%) cases, after less than 10 exposure in 138 (26.39%) cases, after more than 10 exposure in 69 (13.18%) cases and always in 41 (7.84%) cases. Sailors had seasickness in calm sea (3.82%), in moderate sea (24.28%) and in rough sea (71.70%). No sailor required evacuation from sea to land for seasickness. Seasickness is troublesome for sailors, but majority of the symptoms were minor inconvenience and self-limiting without very few exceptions. For better confirmation and future prospect, study may be conducted in a larger aspect including both sexes.

**Key words :** Seasickness, sailor, naval person.

**Introduction**

Seasickness is a form of motion sickness characterized by a feeling of dizziness, nausea, fatigue, and vomiting after spending time on a craft in water<sup>1</sup>. The rocking motion of the craft typically brings it on. Some people are particularly vulnerable to the condition with minor stimulus and feel seasick simply by getting foot on a boat, even if the vessel is in dry dock, while others are

relatively immune through exposure. Some people have even claimed experiencing seasickness while watching nautical themed television programs. No one can gain immunity against seasickness and even the oldest sailors can be subject to it. The New York Times as early as 1877 tried to explain seasickness in a scientific way<sup>2</sup>. Seasickness can be a debilitating condition and can be dangerous if the sufferer has an important role to carry out, such as member of naval forces appointed in an operational work at sea. It is also particularly hazardous for scuba divers<sup>3</sup>, who, through dehydration are at increased risk of decompression illness. In critical military tasks, seasickness would impede mission effectiveness. For those personnel assessment of susceptibility to motion or seasickness in an operational environment has the highest predictive validity.

In critical military tasks, seasickness would impede mission effectiveness. For those personnel assessment of susceptibility to motion or seasickness in an operational environment has the highest predictive validity. Military organizations of some countries (e.g. France, Israel and United Kingdom) employ an operational selection for naval and air force personnel<sup>4,5</sup>. In Bangladesh Navy, so far, there is no organized study done on incidence and effects of seasickness among naval personnel. As seasickness reduces the operational power, capabilities and effectiveness of sailors, when ship is in operation, this prospective descriptive study was designed to assess the incidence, severity and effects of seasickness among naval personnel of Khulna naval base.

**Materials and Methods**

A descriptive study on incidence and severity of seasickness on sailors of Bangladesh Navy was carried duration the period from August 2007 to January 2009. This subjects of study were employed in 25 naval ships of Khulna Naval Base. Sizes of the ships were medium to small size and number of work force ranges from 34 to 91. Total 1293 sailors were included in the study. All were male and age ranged from 20 to 45 years. All the sailors were apparently healthy and without any systemic disease before boarding the ships. Each person traveled the sea in every season of the year, in both normal weather and inclement weather. Total sea trips for each ship were 8 to 14 per year. Staying in the sea was different, minimum 3 days to maximum 20 days. Sailors had variety of

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responsibility and located in different position in the ships. Written questionnaire were supplied to medical assistant of the ships and information about physical and behavioral complaints of the sailors were collected. Questionnaire included information about sailor's demographics, duration at sea, types of symptoms, severity of seasickness, incidence of seasickness in relation to exposure and sea condition. The medical assistant gave treatment of sick personnel. Relevant information were collected and analyzed. Results were reported as mean  $\pm$  standard deviation (SD) or percentage (%) as applicable.

## Results

Demographics of sailors are shown in table I and duration of sea trips in table II. More than half (60.71%) of the sailors stayed in sea for less than 7 days. The sailors stayed in sea for at least 3 days and maximum stay was for 20 days.

**Table-I:** Particulars of sailors.

Parameters	Values (mean $\pm$ SD)
Age(years)	30 $\pm$ 8.78
Body weight(Kg)	58.7 $\pm$ 5.69
Height(cm)	171 $\pm$ 4.26

**Table-II:** Duration at sea.

Duration	Number	Percentage
Less than 7 days	785	160.71%
7 to 14 days	311	24.06%
More than 14 days	197	15.23%
Total number of sailors	1293	100%

**Table-III:** Types of symptoms (n=1293).

Symptoms	Number	Percentage
Dizziness	237	18.32%
Fatigue	221	17.09%
Vertigo	147	11.36%
Epigastric discomfort	126	9.74%
Nausea	225	17.40%
Vomiting	85	6.57%

Different types of symptoms of seasickness experienced by sailors are presented in table III. More than one third of total 1293 sailors (40.44%) experienced different symptoms of seasickness and some had multiple symptoms. Those were dizziness (18.32%), fatigue (17.09%), vertigo (11.36%), epigastric discomfort (9.74%), nausea (17.40%) and vomiting (6.57%).

Majority of the sick sailors developed minor inconvenience, self limiting and did not require rest

(78.78%) or required excused from duty for 24 hours (19.31%) and only 10 (1.91%) cases required excused from duty for whole sea period (table IV). Incidences of seasickness in relation to exposure to sea trip are shown in table V.

Frequency of experiencing symptoms gradually reduced during subsequent exposure to sea. Of course, 41(7.84%) sailors always experienced sea symptoms irrespective of exposure. Among total 523 affected sailors, only 20 (3.82%) experienced seasickness in calm sea and in most cases symptoms were precipitated by unrest of sea, ranging from moderate to rough sea condition (table VI).

**Table-IV:** Severity of seasickness (n=523)

Severity of seasickness	Number	Percentage
Minor inconvenience, self limiting and not required rest	412	78.78%
Require rest for 24 hours	101	19.31%
Complete excuse of duty throughout sea period	10	1.91%
Total affected sailors	523	100%

**Table-V:** Incidence of seasickness in relation to exposure to sea trip (n= 523).

Number of exposures	Number	Percentage
First exposure	275	52.59%
Less than 10 exposure	138	26.39%
More than 10 exposure	69	13.18%
Always	41	7.84%

**Table-VI:** Incidence of seasickness in relation to sea condition (n=523).

Sea condition	Number	Percentage
Calm	20	3.82%
Moderate	127	24.28%
Rough	375	71.70%

## Discussion

Seasickness is a type of motion sickness presented with a peculiar set of symptoms experienced by many persons when subjected to the pitching and rolling motion of a vessel at sea, of which depression, giddiness, nausea, and vomiting are the most prominent. The scientific literature does not convey a consistent picture of the effect of motion sickness on human performance<sup>6,7</sup>. It is beyond doubt, the act of vomiting has a direct effect on performance, but this is transitory in some sailors and they can maintain their ability to carry on allotted tasks

despite periodic vomiting. Others, however, in whom the classical signs and symptoms of motion sickness are less severe, are overcome by apathy and depression. Rolnick and Gordon<sup>6</sup> described a helplessness reaction, which causes a decrement in performance through cognitive, emotional, and motivational deficits.

The symptoms of seasickness appear when the central nervous system receive conflicting messages from the other four systems - the inner ear, eyes, skin pressure receptors and muscle-joint receptor. The pivotal role of the balance organ of the inner ear, the vestibular apparatus, in motion sickness has been recognized for more than a century. Subsequent efforts to evoke motion sickness in humans and animals deprived of vestibular function have consistently failed, and even partial destruction of vestibular receptors confers a degree of immunity, at least until central nervous system (CNS) compensation for the sensory loss has occurred<sup>8</sup>. The importance of the vestibular system in motion sickness led to the concept that the condition was due to over stimulation<sup>9</sup>. Human being instinctively seek to remain upright by keeping their centre of gravity over their feet. The most important way of achieving this is by visual reference to surrounding objects, such as horizon. Seasickness often results from the visual confusion on a moving craft, when nearby objects move with the motion of the craft. Seasickness has such a remarkable effect because the motion of a craft on water disturbs both the sense of sight and touch. The severity of seasickness is also influenced by irregular pressure of the bowels against the diaphragm as they shift with rising and falling of the ship.

This study, it was tried to evaluate frequency of incidence and effects of seasickness among naval personnel in their normal duty. Incidences of seasickness found in 523(40.44%) sailors and they faced different types of syndrome ranging from mild dizziness to vomiting and most of the seasickness found in rough sea condition. Majority of the symptoms were minor inconvenience and were self-limiting without very few exceptions and seasickness did not reduce the operational power, capabilities and effectiveness when ship was in operation. In an extensive study<sup>10</sup> carried out on board a 16,000-ton troop ship on trans-Atlantic crossings, the incidence of vomiting ranged from 20% to 41%. Similar sickness rates have been reported in other military transport ships<sup>4</sup>. The relative incidence of some of these symptoms in 10 US Navy flight studied by Kennedy and colleagues<sup>11</sup> confirm the similar findings. Data from other studies also supports these findings<sup>10,12</sup>.

The surest way to prevent seasickness is to avoid exposure to provocative motion environments. Some of the measures are hydration, fresh air, keep sight on fix object, suitable position in the middle of the ship and some remedies like acupressure, acustimulation<sup>13</sup>, ginger

root, and antiemetic and antihistamine medications<sup>14</sup>. Some of homeopathic medicine claimed to be effective in symptomatic relief of seasickness<sup>15</sup>. Increasing individual tolerances by desensitization therapy sometimes applied for them but adaptation is the most potent prophylactic. This is nature's cure and where predictable, acquiring protective adaptation is preferable to administering anti-motion sickness drug to military personnel. Variants of desensitization therapy include the use of other adapting stimuli, such as vertical linear oscillation and moving visual patterns (optokinetic stimuli), in the belief that there will be better generalization of the adaptation to the environment than that achieved when only cross-coupled stimulation is employed in the ground-based phase of therapy<sup>16</sup>. The literature on desensitization therapy reviewed by Stott<sup>17,18</sup> and Dobie and May<sup>19</sup> confined to the treatment of flying personnel. In this study adaptation helped to cure seasickness to some extent, incidences of symptoms decreased with number of exposure, which indicates natural healing.

There are different strategies and line of treatment of seasickness<sup>20,21</sup>. Over the years, many remedies have been recommended for treatment for seasickness<sup>22,23,24</sup>. However, none provides complete protection and none is without side effect. Of the currently available drugs, the centrally acting scopolamine is probably the most effective single drug<sup>25</sup>. A number of drugs those were developed and marketed primarily for their antihistaminic properties shown to be effective in motion sickness as well as seasickness<sup>26,27,28</sup>. These are promethazine, dimenhydrinate, cyclizine, meclizine and cinnarazine<sup>28,29</sup>. All of these drugs cause drowsiness, sedation, dizziness, dry mouth and blurred vision. Individuals with severe symptoms, failed to get benefit from oral medications, require injectable drugs. Repeated vomiting and inability to retain ingested fluids carry a risk of dehydration and electrolyte imbalance. For them intravenous infusion of fluid and electrolyte replacement is necessary. In this study, medical assistant of the ship provided treatment with simple antiemetics and rest. No sailor was evacuated from sea to land for seasickness during the study period.

## Conclusion

Exposure to unfamiliar motion at sea produces a syndrome consisting of pallor, nausea and vomiting. Whether seasickness is an ancient or a modern disease, it is certainly frequent at the present day. Drug treatment may reduce symptom, but it also have some side effects. Therefore, prevention should be the better choice for operational work at sea. From this study it is observed that seasickness is troublesome for sailors, but majority of the symptoms were minor inconvenience and self-limiting. Excluding a few exceptions seasickness did not reduce the operational power, capabilities and effectiveness when ship was in operation in Khulna naval base. For better confirmation and future prospect, study may be conducted in a larger aspect including both sexes.

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