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ORIGINAL ARTICLE

Spectrum of Symptoms in Motion Sickness

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Objective: To search and report extraordinary symptoms of motion sickness (MS) which have not been classically described.

Study Design: Prospective study.

Setting: Tertiary referral center + state hospital

Patients: Thiry-four MS patients were included in the study. Of these, 32 were female and 2 were male.

Intervention(s): No

Main Outcome Measures: All patients were asked to fillout a questionaire by face to face conversation for their symptoms. Severity of MS symptoms in general were assessed by visual analog scale. In addition, factors precipitating MS symptoms were also searched.

Results: All patients reported to have nausea. In addition to classical knowledge, atypical symptoms decleared by the patients were intolerance to smell, feeling of nausea in the head, intolerance to sound and difficulty in concentrating on conversation. Average VAS score for severity of MS symptoms was found to be 7.3. Relaxing of the symptoms when the eyes were closed was noted as an important feature. Sixteen (47%) reported no symptoms of MS while driving a car. The most important factors leading to the beginning of MS symptoms were curving road, reading, head movements, talking, and the smell of gasoline, respectively.

Conclusion: The clinical picture of acute MS may include the symptoms other than the classical symptoms like dizziness, nausea, pallor, cold sweating etc.

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Introduction

Motion Sickness (MS) can be defined as a condition induced by passive locomotion in vehicles. This condition expresess itself with many unclear symptoms. Hence, a detailed and clear description of symptomatology experienced by the patients is of paramount importance to be able to understand and to make a comment on its pathophysiology. Classically, it is stated that the symptoms of MS are dizziness, physical discomfort, nausea, tiredness, pallor, cold sweating, occipital headache and periodic yawning [1]. Most of these symptoms (nausea, tiredness, pallor, headache, cold sweating) can be understood by the examiner since they are the symptoms experienced by almost everybody for different reasons. It is not necessary, however, that every individual will have similar symptomatology. Symptoms of motion sickness can vary from person to person, and many times it can be difficult for the patients to explain them to other people.

The primary author of the present study (GGA) has experienced different types of symptoms induced by motion in a vehicle, which were not mentioned in classical text-books. Hence, this study has been

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designed to search whether other patients have also experienced similar symptomatology provoked by motion, and to report also some other features of acute clinical picture of MS which were not informed previously.

Materials and Methods

Thirty-four MS patients were enrolled into the study between 2007 and 2011. Primary author (GGA) prepared a questionaire for MS including classical defined symptoms and her atypical symptoms (Appendix). All patients were asked to fillout a questionaire about their motion sickness by face to face conversation. The patients who could not describe their complaints in detail were excluded. The severity of MS in general was assesed by visual analog scale (VAS) rated between 0 (no symptom) to 10 (worst).

The atypical clinical presentation of MS described by primary author (GGA), which is the main subject of this research is as follows: The initial symptom of MS is nausea. It gradually increases as the motion continues, and at the same time the feeling of cloudiness starting from the abdomen towards the head occurs. In this condition the patient loses her/his concentration and concern to any stimulus from environment. She/he can not tolerate any conversations. When she/he tries to concentrate on anything, i.e. following conversation or reading, this provokes her/his complaints. She/He does not explain any balance problem because she/he can control her balance easily. It is not a true vertigo nor dizziness or lightheadedness. Driving a car does not cause any disturbance.

Results

Of 34 MS patients 32 (%94.1) were women and 2 (%5.9) were men. The average age of the patients was 39.6 (Range:16-94 yo). There were 13 medical doctors (2 otolaryngologists), 3 nurses, 1 teacher, 1 university prelector, 1 high-school student, 4 white-collars, 7 housewifes, 4 maids. Educational status of the patients were as follows: 17 university graduate, 8 high-school, 10 elementary school.

Of 34 patients, 33 (97%) reported symptoms while he/she was travelling by car. One patient who did not decleared MS in car decleared MS only by bus. Twenty-two (64.7%) reported MS on ship, 5 (14.7%) in plane, 30 (88%) on bus, 7 (20.6%) in train, 5 (14.7%) in elevator. Interestingly 14 (41.2%) patients also reported acrophobia.

The incidence of MS symptoms among the study group is shown in Table 1. Nausea was reported by all patients. Some symptoms not previously reported such as intolerance to smell, feeling of nausea in the head, intolerance to the sound and difficulty in concentrating on conversation, were the dominant symptoms in a significant number of cases. In addition, relaxing of the symptoms when the eyes were closed was noted as an important feature. Factors precipitating and/or increasing the severity of the symptoms are listed in Table 2.

Table 1. Incidence of MS symptoms among the study population (n=34).

SYMPTOM	INCIDENCE
Headache	13 (38.2%)
Vertigo	15 (44.1%)
Dizziness	13 (38.2%)
Feeling of nausea in head	24 (70.6%)
Nausea	34 (100%)
Vomitting	25 (73.5%)
Lack of appetite	22 (64.7%)
Tiredness	25 (73.5%)
Weakness	26 (76.5%)
Feeling of faintness	3 (8.8%)
Cold sweating	12 (35.3%)
Inability to work	18 (52.9%)
Disquite	23 (67.6%)
Discomfort	23 (67.6%)
Nervousness	12 (35.3%)
Sleepiness	15 (44.1%)
Inability of concentration	25 (73.5%)
Blurring vision	3 (8.8%)
Relaxing when closing the eyes	27 (79.4%)
Intolerance to the sound	16 (47%)
Intolerance to the smell	29 (85.3%)
Intolerance to the conversation	23 (67.6%)
Aural fullness	11 (32.3%)
Tinnitus	6 (17.6%)

Table 2. Incidence of the precipitating factors for MS symptoms in study population (n=34)

Precipitating Factor	Incidence
Reading	29 (85.3%)
Talking	25 (73.5%)
Curving road	31 (91.2%)
Head movements	26 (76.5%)
Following the objects with eyes	22 (64.7%)
Sitting at the back seat	22 (64.7%)
Smell of cigarette	19 (55.9%)
Smell of gasoline	24 (70.6%)
Sitting opposite direction to the vehicle route	4 (11.8%)

Twenty-two patients had a licence for driving car. Of these, 16 reported relief of their symptoms while driving cars, but 6 reported no relief. The begining of the symptoms were reported to be varied between just after and 1 hour after getting in to the vehicle.

Average VAS score for severity of MS symptoms were 7.3 (Range 4 - 10). Nineteen patients decleared that the severity of MS was decreased by age, while 14 patients reported no change by age. On the contrary 2 patients reported an increase in severity of MS by age.

Discussion

The term "motion sickness" is used to describe acute clinical picture provoked by passive motion while travelling in any type of air, sea, car and space vehicle. MS can be accepted as a psychophysiological response of healthy individuals which can be occured by real or apparent motion stimulation of significant intensity and/ or duration [2]. The characteristics of a general autonomic nervous system response during MS occur as a motion sickness response which shows gastrointestinal and other peripheral changes [2]. It is clear that during the process of MS parasympathetic nervous system withdrawl and sympathetic nervous system activation plays a role. Classically, the full picture of acute motion sickness includes symptoms of dizziness, physical discomfort, tiredness, periodic yawning, and pallor [1]. In our survey, nausea was the common complaint reported by all patients. This supports the observation that the physical intensity of the stimulus is not necessarily related to the degree of nauseogenicity [3]. However, the incidence of some other classical symptoms of MS such as vertigo, dizziness, cold sweating and headaches, was not found to be high as previously considered (Table 1).

This survey indicated that apart from the classically defined symptoms of MS, some additional symptoms should also be questioned. The most interesting and most difficult to understand complaint was the symptom that was defined as "feeling of the nausea in the head" reported by 24 (70.6%) patients which most of them were well-educated. All these 24 patients made a clear distinction between the nausea and "feeling of nausea in the head". When they were asked to detail about this bizarre symptom, they all indicated that "there is no other or better definition explaining their feeling"!. From the physician's perspective, it is difficult to understand this explanation. There is a consensus among many otolaryngologists that there is a necessity to define the symptoms such as vertigo, more clearly [4]. The same helds true for clinical picture of MS patients. From this perspective the educational status of the patient is very important. Hence, we intentionaly chose as many as possible educated patients, preferably doctors and nurses, in this study. Considering that majority of the patients reporting this bizarre symptom were well-educated people, two of which were otolaryngologists, even their educational status may not be sufficient to explain some symptoms clearly!

The variety of stimuli that can provoke MS is wide [3]. Avoiding them may be advised for preventing development of the MS symptoms [1]. However, there is no information about their frequencies. In the present study, curving roads were the most frequent precipitating stimulus in 90 % of the patients. It was reported that patient sitting at the rear seat and reading were at risk of developing motion sickness [1]. In our study, 85% of the patients were reported that reading was the provocative factor, and 64% was reported sitting at the rear seat as precipitating factor.

Head movements while travelling in a car provoked MS in 76% of the patients in the present study. This implies the possible role of the labyrinth in the

pathogenesis of MS. High incidence of travelling on curving roads as a precipitating factor can also support the role of the labyrinth. It was claimed that "vision" was only a secondary rather than essential aetiological factor in the genesis of motion sickness [1]. Nevertheless, the finding of high frequency of "relaxing when the eyes were closed" might support that "vision" has almost equal contribution in the pathogenesis.

The possible relationship between motion sickness susceptibility and personality has been debatable [1]. It is also reported that relationship between MS and some physchological disorders such as anxiety and claustrophobia is also possible [5,6]. In addition, we found an incidence of 41% acrophobia among our MS patients. We do not have any explanation on the significance of this finding.

In conclusion, MS has wide spectrum of symptoms of which some are difficult to define. Incidence of the classically defined symptoms may not be as high as considered before.

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