Knowledge, Attitudes and Practices Relating to Vertigo among Newly Diagnosed Patients: Findings of a Prospective, Observational Registry in India

M Kameswaran¹, S Pujari², L Basumatary³, J Singh⁴, K Sarda⁵

Abstract

Objective: Vertigo is a common complaint in clinical practice, with multi-causative etiology, substantially impacting individual’s overall lifestyle and behavior. However, so far no much data is available to understand the knowledge, attitude and practices (KAP) about vertigo in newly diagnosed Indian patients. Hence, the objective of this prospective, non-interventional, observational registry was to evaluate KAP towards vertigo and assessment of their awareness through a questionnaire-based survey.

Methods: Newly diagnosed patients with vertigo (aged ≥18 years), visiting the physicians, were provided with a self-administered validated questionnaire with domains namely knowledge (18 questions), attitude (7 questions), and practices (8 questions). Primary objective was to analyze the percentage of patients with high, average and low level of knowledge; percentage of patients who were little, quiet and extremely concerned about vertigo and its treatment; percentage of patients taking high, moderate and poor level of precaution towards vertigo. All variables were subjected to statistical analysis.

Results: Overall, 1167 (76.8%) patients completed the KAP questionnaire (women: 52.9%; men: 47.1%). A total of 17.3% patients had low level of knowledge, 73.9% had average and 8.74% patients had high level of knowledge regarding vertigo. Attitude domain revealed that majority of the patients (86.20%) had little concerned attitude towards vertigo; 9.85% patients were extremely concerned and 3.94% patients were not concerned regarding vertigo. Practice domain revealed that none of the patients took high level of precautions, 79.8% patients took moderate precautions and 20.2% took less precaution for disease prevention.

Conclusion: This study revealed that the knowledge, attitude and practice patterns amongst Indian vertigo patients are inadequate, highlighting the need for awareness and scientific education amongst these patients in India. Moreover, health care providers should be trained to provide counseling to these patients effectively.

Editorial Viewpoint

• Vertigo substantially impacts lifestyle and behaviour.
• The study reveals that knowledge, attitude and practice patterns amongst Indian vertigo patients are inadequate emphasizing need for awareness and education.

Introduction

Vertigo, a common complaint in clinical practice, is characterized by dizziness and illusion or hallucination of movement, usually rotation, either of oneself or the surroundings or both.¹ Secondary symptoms include postural instability, cold sweating, nausea and vomiting². Vertigo is about two to three times more common in women than in men and its incidence increases with age.² A survey in Germany reported prevalence of vertigo to be 22.9% and an incidence of 3.1%.³,⁴ The 1-year prevalence for vertigo was reported to be 48.3% according to an epidemiological study conducted in France.⁵

The most common causes of vertigo are vestibular disorders including benign paroxysmal positional vertigo (BBPV), Meniere’s disease (MD), vestibular neuritis, and labyrinthitis. The
effect of vertigo on each patient can vary depending on the underlying cause. Although often perceived as a mild physical disorder with low morbidity, the psychological impact of vertigo can lead to a substantial change in the individual’s lifestyle and behaviour. When patient perspective on impact of dizziness on driving was studied through a self-administered questionnaire, it was found that few had ever been warned not to drive and 52% said that even if they were warned, they would not have stopped driving. This study demonstrated poor knowledge and careless attitude towards dizziness amongst patients.

The precise incidence and prevalence of vertigo in the general Indian population is still unknown. The overall prevalence of vertigo in an adult community in India was reported to be 0.71% in 2001. In a cross-sectional study conducted in geriatric patients, the prevalence of dizziness/vertigo was as high as 3%. Another study conducted recently in India reported that one out of every four elderly patients with peripheral vestibular disorder had a risk of ‘fall’. Recurrent episodes of vertigo can be prevented if patients adhere to the preventive measures advised by the treating physicians, for e.g., performing vestibular rehabilitation exercises routinely in case of peripheral vertigo or controlling risk factors for stroke which may decrease the risk of developing central vertigo, etc.

Nevertheless, patient’s perspective towards vertigo in Indian context has only gained minor attention so far. Hence this vertigo registry was initiated to assess the knowledge, attitude and practice (KAP) patterns amongst Indian patients with new onset vertigo. Understanding the KAP responses will enable the health authorities/policy makers to implement feasible evidence based health policies to enhance awareness level, eventually improving the health-related quality of life.

**Methodology**

**Study Design**

This multicentre, prospective, non-interventional, observational registry enrolled patients visiting physicians, from 37 sites (17 ENTs, 10 Neurologists and 10 Consulting Physicians), across four different geographical zones (North, South, West and East) of India, between June 2015 and May 2016. Data regarding the KAP amongst these enrolled patients are included in this publication. A validated questionnaire was used to assess the KAP in these patients.

This study was conducted in accordance with the protocol, International Conference on Harmonization-Good Clinical Practice (ICH-GCP) guidelines, the Declaration of Helsinki, Indian Council of Medical Research (ICMR), and Indian GCP guidelines. Independent Ethics Committee (IEC) approved the study protocol, questionnaire and participant authorization form (PAF) used in this study.

**Selection Criteria**

Patients (aged ≥18 years) visiting physicians, diagnosed with new onset vertigo, able to read/write English for administrating KAP questionnaire and willing to provide a written authorization to participate were included in the KAP study. Patients newly diagnosed with vertigo requiring hospitalization for any cause, patients already on vertigo treatment and/or pregnant women were excluded from the study.

**Study Assessments**

A self-administered study questionnaire with three domains namely knowledge, attitude and practices was used for assessing awareness about vertigo in the patients (Appendix 1). The questionnaire was validated and modified as per the requirement in a different study population; validation was conducted in a separate sample of 100 patients prior to being used in the present.

The knowledge domain of the questionnaire included 18 positive and negative statements related to causes, symptoms and treatment of vertigo. The patients were to respond if the statements were ‘true’ or ‘false’ or if they ‘did not know’. A scoring system was applied, where 1 point was given for each correct answer and no point was given for an incorrect answer including the response of ‘don’t know’. Depending on the number of correct answers, the level of knowledge of patients was categorized as “low” (≤7 points), “average” (8-13 points) or “high” (≥ 14 points).

The attitude domain of the questionnaire had 7 questions that were designed to assess the attitude of patients towards the disease and treatment. Patients ranked their responses using a 5-point Likert scale ranging from 5 to 1, where 5: strongly agree, 4: agree, 3: neutral, 2: disagree, 1: strongly disagree. Depending on the level of concern, patients were grouped into 4 categories: extremely concerned (if agreement was evident for all 7 statements), quite concerned (if agreement was evident for 4-6 statements), little concerned (if agreement was evident for ≤3 statements) or not concerned (if there was no agreement). The agreement was defined as ‘strongly agree’ or ‘agree’ responses to positive statements and a ‘strongly disagree’ or ‘disagree’ response to negative statements.

The practice domain of the questionnaire had 8 questions which aimed at assessing the precautionary actions taken by patients and required the patients to respond as ‘yes’ or ‘no’ to each precautionary measure. A scoring system was applied. One point was given for each required practice measure undertaken. Thus, the total precaution score ranged from 0 to 8 points. A high level of
Appendix 1: Validated Vertigo KAP Questionnaire

SECTION I: KNOWLEDGE
Please indicate whether you agree or disagree with the following statements by marking ‘True’ or ‘False’. In case you are not sure of your response please tick ‘Don’t know’

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Statements</th>
<th>True</th>
<th>False</th>
<th>Don’t know</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Vertigo is a feeling of fainting due to fear of height.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>2</td>
<td>Vertigo is a feeling of nausea and vomiting while in motion.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>3</td>
<td>Vertigo is a feeling of moving or spinning when not in motion or that the world is spinning around you.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>4</td>
<td>Vertigo is a feeling of drifting to one side while walking.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>5</td>
<td>Vertigo is a disease transferred from parents to children.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>6</td>
<td>If you have vertigo, you may feel worse when you move your head or change positions (stand up, roll over).</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>7</td>
<td>If you have vertigo, you may feel worse when you cough or sneeze.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>8</td>
<td>Vertigo may last for seconds, hours or days.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>9</td>
<td>Vertigo may be accompanied by nausea and vomiting.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>10</td>
<td>Vertigo may be accompanied by loss of hearing and ringing sensation in the ears.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>11</td>
<td>Vertigo may be accompanied by mood swings.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>12</td>
<td>Vertigo may be accompanied by seeing double, having trouble speaking or swallowing, or feeling weak.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>13</td>
<td>Vertigo may be accompanied by a headache or sensitivity to light and noise.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>14</td>
<td>Vertigo may occur due to a viral or bacterial infection of the inner ear (after cold or flu).</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>15</td>
<td>Vertigo may be associated with migraine.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>16</td>
<td>Head injury may cause vertigo.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>17</td>
<td>Vertigo may occur due to use of certain medications.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>18</td>
<td>Vertigo can be treated with physiotherapy.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

SECTION II: ATTITUDE
(Please tick the most appropriate option for the below statements)

1. Medication for treatment of vertigo should be taken in consultation with physicians only.
   - Strongly agree
   - Agree
   - Neutral
   - Disagree
   - Strongly disagree

2. If suffering from vertigo, one should keep still and rest when symptoms occur.
   - Strongly agree
   - Agree
   - Neutral
   - Disagree
   - Strongly disagree

3. One should restrict social activities with friends and family, if suffering from vertigo.
   - Strongly agree
   - Agree
   - Neutral
   - Disagree
   - Strongly disagree

4. If suffering from vertigo, one should inform his/her employer if his/her job involves operating machinery or climbing ladders.
   - Strongly agree
   - Agree
   - Neutral
   - Disagree
   - Strongly disagree

5. Physiotherapy exercises to treat vertigo advised by the physician/physiotherapist can be done once in a while.
   - Strongly agree
   - Agree
   - Neutral
   - Disagree
   - Strongly disagree

Contd...
**Appendix 1: Validated Vertigo KAP Questionnaire (Contd..)**

**SECTION III: PRACTICE**

*(Please indicate whether you practice the following or not by marking ‘Yes’ or ‘No’ for the below-mentioned statements)*

<table>
<thead>
<tr>
<th>S.No</th>
<th>Practice Measures</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Do you keep still and rest when you feel the symptoms of vertigo?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Do you get up slowly when getting out of bed and sit on the edge of the bed for a minute or so before standing?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Do you avoid sudden bending down to pick things or looking for something on a high shelf?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Do you exercise regularly as advised by physicians to prevent vertigo?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Do you move your head carefully and slowly during daily activities?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Do you avoid activities such as driving, operating heavy machinery, and climbing until 1 week after your symptoms disappear?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Do you avoid bright lights, TV, and reading during a vertigo attacks?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Do you use a cane or other help for walking if you have a loss of balance during a vertigo attack?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Table 1: Baseline characteristics of the study population**

<table>
<thead>
<tr>
<th>Variable</th>
<th>All patients (N=1520)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, years</td>
<td>50.0 (18,88)</td>
</tr>
<tr>
<td>Age groups, n (%)</td>
<td></td>
</tr>
<tr>
<td>≤30</td>
<td>191 (12.6)</td>
</tr>
<tr>
<td>31-40</td>
<td>268 (17.6)</td>
</tr>
<tr>
<td>41-50</td>
<td>308 (20.3)</td>
</tr>
<tr>
<td>≥51</td>
<td>753 (49.5)</td>
</tr>
<tr>
<td>Sex, n (%)</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>712 (46.8)</td>
</tr>
<tr>
<td>Female</td>
<td>808 (53.2)</td>
</tr>
<tr>
<td>Educational Qualification*, n (%)</td>
<td></td>
</tr>
<tr>
<td>Undergraduates</td>
<td>235 (20.1)</td>
</tr>
<tr>
<td>Graduates</td>
<td>660 (56.6)</td>
</tr>
<tr>
<td>Post-graduates</td>
<td>231 (19.8)</td>
</tr>
<tr>
<td>Others</td>
<td>41 (3.51)</td>
</tr>
</tbody>
</table>

*The data is calculated for 1167 patients who completed the KAP questionnaire.

The study were percentage of patients with high, average and low level of knowledge regarding vertigo; percentage of patients who were not concerned, little, quite and extremely concerned about vertigo and its treatment; and the percentage of patients taking high, moderate and poor level of precaution towards vertigo.

**Statistical Analysis**

All variables were subjected to statistical analysis. All continuous and semi-quantitative variables were described in terms of a number of observations (n), mean, standard deviation (SD), median, minimum and maximum. The summary of categorical data was presented in terms of frequency count (n) and percentages (%). Further, pair wise association between the three endpoints, namely knowledge, attitude and practice domain was analyzed using Pearson chi-square test at 5% level of significance. Statistical analyses were performed using SAS® Version 9.2 (SAS Institute Inc., USA).

**Results**

**Patients**

A total of 1520 patients were enrolled in the vertigo registry. Out of this, 1167 (76.8%) patients who fulfilled the inclusion criteria and consented, participated and completed the KAP questionnaire (women: 52.9% [n=617]; men: 47.1% [n=550]). The mean ± SD age of the population was 50.2±15.37 years (min: 18; max: 88). Out of 1167 patients, about 20.1% patients were undergraduates; 56.6% of the patients were graduates; and 19.8% patients were post graduates. The baseline characteristics of the patients are presented in Table 1. A total of 202 (13.3%) out of 1520 patients had history of at least one significant medical condition at baseline. Among these patients, 55.5% had history of cardiovascular disease and 38.6% had diabetes mellitus. Other medical conditions reported by the patients included neurological disorder (7.4%), hormonal dysfunction (5.9%), recent infections (3.5%), head and neck trauma (1.0%), psychological disorder (0.5%) and others (6.9%). Surgical history was reported in 24 (1.6%) patients.

**Knowledge Domain**

The results revealed that majority of the patients (73.9%) had moderate level knowledge, as indicated by score of 8-13 points. About 17.3% patients had low level of knowledge regarding vertigo (score ≤7 points). Only 8.7% patients had high level knowledge (Figure 1). Majority of the patients were aware of the signs such as that vertigo is a feeling of moving or spinning when not in motion or that the world is spinning around you (86.7%); feeling worse when the patient move head/change positions (74.0%) or when the patient cough or sneeze (65.6%). More than half of the patients were also aware that vertigo may last for seconds, hours or days (69.0%) and may be accompanied by nausea and vomiting (68.2%), loss of hearing...
and ringing sensation in the ears (63.8%), seeing double, having trouble speaking, swallowing, feeling weak (69.7%) or by a headache or sensitivity to light and noise (71.4%). Patients were also aware that vertigo may occur due to a viral or bacterial infection of the inner ear after cold or flu (59.3%), could be associated with migraine (64.7%) and/or may result due to head injury (61.7%), use of certain medications (61.3%) and can be treated with physiotherapy (69.3%).

However, a significant proportion of patients had misconceptions that vertigo is the feeling of fainting due to fear of height (76.2%); feeling of nausea and vomiting while motion (75.7%) or the feeling of drifting to one side while walking (76.3%). About 54.3% of the populations believed that vertigo is transmitted from parents to children and is often associated with mood swings (60.2%) (Table 2).

### Attitude Domain

The attitude of the patients towards vertigo showed that majority of the patients (86.2%) was little concerned about vertigo as interpreted by their agreement to 4-6 statements. About 3.9% patients were not concerned regarding vertigo (agreed for ≤ 3 statements). A total of 9.9% patients showed extremely concerned attitude (agreement to all 7 statements on attitude scale) (Figure 1). Most of the patients agreed that medication for treatment of vertigo should be taken in consultation with physicians only (93.8%) and if suffering from vertigo, one should keep still and rest when symptoms occur (88.9%). However, 65.7% patients had misconception that social activities with friends and family should be restricted if suffering from vertigo (strongly agree: 37.8%; agree: 27.9%; strongly disagree: 2.5%) and that physiotherapy exercises advised by the physician/physiotherapist for...
Vertigo treatment can be done once in a while, if suffering from vertigo (71.5%; [strongly agree: 40.5%; agree: 31.0%; strongly disagree: 1.5%]). About 77.2% patients agreed with the statement that if suffering from vertigo, one should inform his/her employer if the job involves operating machinery or climbing ladders (Table 3).

**Discussion**

The number of vertigo patients are definitely rising both in rural and urban India. Despite its frequent occurrence and effective treatment options, vertigo still remains under-estimated because of lack of awareness among the patients.
and clinicians. Spontaneous remission, atypical presentations and benign course of the disease may be the other contributory factors. Studies have shown that about 20% of an unselected Scottish population have restricted daily life activities due to dizziness. However, only 23% of those people visit their doctor because of their suffering, and dizziness seems to be an underestimated reason for handicap. This point towards a lack of awareness among the patients regarding the condition. Better understanding about cause of the disease, signs and symptoms, and necessary life style modifications would be helpful in adapting preventive measures, improving therapeutic outcomes and the overall quality of life. Patient’s knowledge, attitude and practices also have an effect on medication compliance.

To the best of our knowledge, this is the first study evaluating the level of knowledge, attitude, and practice patterns among the newly diagnosed vertigo patients in India. The results of the knowledge domain of our study revealed that only 8.7% patients had high level of knowledge about the disease whereas 17.3% patients demonstrated low level of knowledge. Even though majority of the patients were aware that vertigo is a feeling of moving or spinning when not in motion, about three-fourth of the population had misapprehensions about the associated signs and symptoms related to the disease (76%). Furthermore, more than half of the patients (60.2%) even believed that vertigo is transmitted from parents to children and is often associated with mood swings.

The attitude domain of the study revealed that majority of the patients (86.2%) were little concerned while 3.9% patients had ‘not concerned’ attitude towards vertigo. Only about 9.9% patients exhibited extremely concerned attitude. When questioned regarding the attitude of the patients towards medication, 93.8% patients agreed that medication for treatment of vertigo should be taken in consultation with physicians only. However, more than half of the patients (65.7%) had misconception that social activities with friends and family should be restricted if suffering from vertigo and that physiotherapy exercises advised by the physician/physiotherapist for vertigo treatment can be done once in a while, if suffering from vertigo (71.5%).

Understanding the cause and taking necessary precautionary measures form the important priorities of patients suffering from vertigo. Surprisingly, none of the patients took high level of precautions towards the disease; about 79.8% patients took moderate level of precautions and 20.2% patients took poor level of precautions. More than half of the population took precautionary measures such as avoiding sudden bending down to pick things or looking for something on a high shelf (76.0%), exercising regularly (66.2%), avoiding activities such as driving, operating heavy machinery, and climbing until one week after symptoms disappear (72.4%), avoiding bright lights, TV, and reading during a vertigo attacks (66.6%) and using a cane or other help for walking if experiencing a loss of balance during a vertigo attack (55.6%).

No association between KAP patterns and gender of the patient was noted in this study. Higher proportion of patients from younger age groups had high knowledge and showed extremely concerned attitude towards vertigo but took poor level of precautions. However, older patients (>50 years) took good precautions but had average level of knowledge. These findings suggest the need for an age dependent counselling of patients with vertigo.

Being the first of its kind KAP study among the newly diagnosed vertigo patients in India, may be considered as strength of the study. Our study was performed in over 37 centres across four different geographical zones of India, involving 1520 patients ranging between 18 and 88 years of age. To the best of our knowledge, this is the largest sample size for the study of vertigo in India, in a diverse population. The participants were representative of different gender, age groups and economic conditions. More than half of the study population were graduates/post graduates. The participating investigators included ENT specialists, Neurologists, and MD Medicine. However, data regarding the educational qualification were not captured, which would have been in turn helpful in understanding the response appropriately based on their educational qualification.

The finding of this study revealed that the knowledge, attitude and practice patterns amongst Indian vertigo patients is inadequate, highlighting the need for awareness and scientific education amongst these patients in India. The gaps between the knowledge and the prevailing practices were obvious in this study. This data will be helpful for the clinicians to comprehend the real-world picture of disease, practices followed, misconceptions and treatment outcomes. India being a developing country requires targeted awareness campaigns to make its people well-informed and well-resourced with the disease condition. These awareness campaigns need to be organized at physician level and also at the doorstep of general people. Furthermore, health care providers should be trained to provide counseling to these patients effectively.

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Author Contributions

All authors contributed to study design, data interpretation, development of this manuscript and approved the final manuscript for submission. All authors met the ICMJE criteria for authorship and all those who met those criteria are listed as authors. All authors had full access to all the data in the study and had final responsibility for the decision to submit for publication.

Conflict of Interest

Dr. Kameswaran, Dr. Pujari, Dr. Basumatary and Dr. Singh have received research funding from Abbott as a consultant. Dr. Sarda is an employee of Abbott India Ltd.

References