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KNOWLEDGE AND PRACTICE REGARDING USAGE OF SUBLINGUAL GLYCERYL TRINITRATE

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ABSTRACT

Cardio vascular diseases are foremost in causing death globally. Sublingual Glyceryl Trinitrate (GTN) tablets are usually taken on an as needed basis for self-management of angina. A dearth of knowledge on usage of GTN tablets and the ignorance on calling for help may cause deleterious effects due to delay in receiving treatment. The objective of this study was to assess the knowledge and practices on usage of GTN tablet and the influence of socio-demographic factors among the patients attending Cardiology clinic at Teaching Hospital, Jaffna. It was a descriptive cross-sectional study, using a validated interviewer administered questionnaire. The study was conducted among statistically recruited sample of 256 patients. The total score of 0-10 was considered as 'Poor Knowledge' while 11-20 as 'Good Knowledge'. Majority (n=172) were males and the mean patients' age (SD) was 66(±9) years. Almost 94.1% of the participants were known about the indication of the medicine. More than three fourth 77.3% (n=198) of the participants were presented with poor knowledge while 22.7% were found with good knowledge. Educational level was statistically associated with the level of knowledge (p<0.05). Although, 81.2% carried their GTN tablets all the times, only 48% (n=123) of the participants were aware that the tablets should be replaced every eight weeks. All female participants carried their tablets properly in a way of protecting from direct

light and body heat. Over all, knowledge was poor and there is a need for frequent reinforcement of patient education during prescribing and dispensing.

Key words: Knowledge, Practice, Nitroglycerin, Sublingual Glyceryl Trinitrate

INTRODUCTION

Coronary heart disease also called as Ischemic heart disease or coronary artery disease is a kind of cardio vascular disease, which is a leading cause of morbidity and mortality globally. The risk factors associated with coronary heart disease are blood pressure, cigarette smoking, cholesterol, diabetes, obesity, left ventricular hypertrophy and family history of premature coronary heart disease etc. Angina is the common manifestation of Ischemic heart disease. The nitrates are generally prescribed in management of Ischemic heart disease. They are given to the patients with angina pectoris, acute myocardial infarction and heart failure. The widely utilized organic nitrates are Nitroglycerin, Isosorbide dinitrate and Isosorbide mononitrate. Nitrates can be rapidly absorbed via Gastro intestinal tract, skin and mucous membrane. They also undergo first-pass hepatic metabolism. Organic nitrates are pro drugs and they undergo biotransformation to liberate nitrous oxide. The nitrous oxide causes Guanyl cyclase, to convert Guanosine

Triphosphate to cyclic Guanosine Monophosphate and leads to vasodilatation. In addition to vasodilatation, nitrous oxide reduces platelet adhesion and aggregation. Among the oral nitrates, Nitroglycerin is the most commonly used drug for controlling angina attacks. Usually it is available and administered as sublingual tablets. There are also other dosage forms like sublingual spray, oral Nitroglycerin, ointment and transdermal patches (Parker and Parker, 1998).

Nitroglycerin also called as Glyceryl Trinitrate (GTN), temporarily relaxes the smooth muscles in the walls of coronary arteries and reduces the force on the heart and assists it to pump blood easily. They are prescribed for self-administration, on an as needed basis for coronary artery disease. Sublingual GTN tablets are administered by placing it under the tongue and allowing to dissolve slowly. The other dose can be taken after five minutes, if the chest pain is not relieved even after first tablet. The maximum of three tablets can be administered within fifteen minutes and should seek medical advice, if the pain persists even after fifteen minutes. GTN is very sensitive to light and heat and should be stored in amber colour glass bottle in cool and dark place. It might cause side effects like headache, dizziness, fall in blood pressure, drowsiness, vomiting and rarely causes restlessness, heart burn, skin rashes and blurred vision (Abrams, 1987).

Knowledge on medication is the particulars received by the patient on correct administration of drug, name of drug, dosage, time interval, frequency of usage, storage, therapeutic goal, interactions and adverse effects (Carvalho et al., 2018). Studies have pointed out that major difficulty faced by patients, in following the treatment was scarce understanding on the prescribed medication and the information offered. Therefore it is vital to express proper

information to the patients, in a way they grasp the greatest knowledge on their disease.(Engel et al., 2012; Pereira et al., 2016). Generally, the advice regarding GTN use will be delivered to the patients by physicians and pharmacist. But the evidences suggest that patient's possess inadequate knowledge on the medication. A study including 89 patients, pointed out that only 43% professed that they had gained related instructions before (Gallagher et al., 2010a). Kunik and Kimble stated that 65% of the participants conveyed poor knowledge on proper use of sublingual GTN and also 32% used the drug for symptoms other than angina. (L P Kimble and Kunik, 2000). About 15% to 37% of patients with coronary artery disease do not receive GTN tablets and in those prescribed, only 30% to 70% of patients report receiving instructions on sublingual GTN. Although patients were prescribed with sublingual GTN for acute chest pain, they were less known about rest of other symptoms like chest discomfort, radiating pain, nausea and arm or jaw pain. (McGovern et al., 2001; Zimmerman et al., 2009) Greater number of the patients were poorly understood the name and side effects of the medication. In addition to the formal education and other related factors of patients, the clear instructions from pharmacist and politeness of pharmacist played a major role on the knowledge of patients on their medication. (Hirko and Edessa, 2017) Also the knowledge on medication had distinguish association with age, females, high educational level, high income and respondents suffering from chronic disease (Dawood, Hassali and Saleem, 2017).

The adequate knowledge and proper practice regarding the usage of sublingual Glyceryl Trinitrate tablet is an essential requirement among patients with Ischemic heart disease. Glyceryl Trinitrate tablet is used in self-management of Angina. The inadequate knowledge and unawareness

on calling for help may worsen the patient condition and leads to deleterious effects because of the delay in getting treatment on time. Also the insufficient knowledge and improper practice of the drug may cause therapeutic failure and other health related problems. Patient education is one of the major factors that enhance the knowledge and promotes the proper practice. Each patient has a unique perspective on their illness. Identifying the areas where the patient was lacked in knowledge may help the instructors to increase the patient knowledge. (Rogers, 1997) A better understanding on the relationship between level of knowledge and influence of socio demographic factors may be very useful in promoting the efficacy of the treatment. Ongoing health care desires a cost effective therapy, which reduces and prevents unnecessary hospital readmissions and medical costs. The proper knowledge and practice regarding the use of sublingual GTN tablets among the patients prescribed with it, will significantly improve the therapy and reduce the misuse of the sublingual GTN tablet.

LITERATURE REVIEW

A search strategy was developed by using key words and key concepts like chronic stable angina, chest pain, angina, coronary artery disease (CAD), sublingual Glyceryl Trinitrate, Nitroglycerin, medication, self-administration, knowledge, practice, use etc. For some key words relevant abbreviations [Glyceryl Trinitrate GTN] and synonyms were considered. Combining search terms like OR, AND [Glyceryl Trinitrate or Nitroglycerin, knowledge and practice] were used to find more relevant literatures related with this research title. The resources like PubMed, Google Scholar and Science direct were utilized for this process. More than this, library catalogue

and journals applicable with this research title were employed.

Knowledge regarding usage of Glyceryl Trinitrate Tablet

Studies regarding the knowledge on medication were conducted all over the world, different studies depict different levels of knowledge. According to it, poor knowledge is crucial in therapeutic inefficacy. A cross-sectional study was conducted in Malaysia on patients' knowledge and use of sublingual Glyceryl Trinitrate therapy by wan Azuati Wan Omar and team. A validated researcher administered questionnaire was utilized. The study found that 41.0% patients had poor to moderate knowledge scores, 37.0% had poor knowledge score and only 22.0% had high knowledge score among 96 patients receiving sublingual GTN tablets from in-patient and out-patient pharmacy. It also emphasized that many of them were unknown on mechanism of the drug, stability of the drug, prophylaxis use and adverse effects of the drug. (Azuati et al., 2014) Another study on knowledge and use of Sublingual Nitroglycerin and cardiac related quality of life in patients with chronic stable angina by Laura P. Kimble and Cherie L. Kunik recruited 50 men and 45 women. An interview lasted for 30 to 40 minutes was used for data collection. This study noted that the mean knowledge score was 5.1 ± 1.7 with an observed range of 0 to 7. Among the participants 65.2% had lacked knowledge on usage of GTN as prophylaxis, and also its activity on preventing angina pain. 31.6% of participants experienced headache when taking GTN for the first time. (L P Kimble and Kunik, 2000)

A questionnaire-based study including fifty patients, 28 men and 22 women was undertaken on patients' knowledge of sublingual Glyceryl Trinitrate. The study detected that patients revealed poor knowledge on their drug treatment. Even though most of them knew the name of the

drug, only 15 patients recalled the directions they received while receiving their GTN tablets. Majority (88.0%) had no idea on maximum dose. Only half of them knew that the tablets should be replaced every eight weeks. Some of them thought that the drug might cause an explosion inside the blood vessels while two of them interpreted sublingual as the ability to speak two languages. (Bailie and Kay, 1988). Another non-experimental, descriptive study was conducted in Australia to assess the cardiac patients' knowledge and use on sublingual Glyceryl Trinitrate. Fifty two inpatients from cardiac ward or coronary care unit were reached and finally 41(87.2%) subjects were recruited. Most of them were on sublingual GTN for many years. The observed total mean score was 3.98(SD=1.21, range 1-7). Approximately a quarter of subjects understood that sublingual Nitroglycerin prevents chest pain. (Fan, Mitchell and Cooke, 2009)

A study on sublingual Nitroglycerin practice in patients with coronary artery disease by Gallagher noticed that sample scored a mean of 7.11 (SD= 2.05). Most of the patients knew that Sublingual GTN was used to treat chest pain and only 45.0% knew the name of the drug. More than half (67.0%) of participants kept their medications in its original container. A significant number of participants had understanding on dose, need on repetitive dose and appropriate body position for having medication. Majority (80.0%) of the people were aware on calling for help if symptoms were unrelieved by Sublingual GTN. Only one third of the participants were aware on avoid using sildenafil together with GTN. (Gallagher et al., 2010)

Practice regarding the usage of sublingual Glyceryl Trinitrate tablet

A study conducted in Malaysia found that 80.2% of patients carried their Sublingual GTN together with them at all

times, but a notable number (35.0%) took their GTN tablets in an inappropriate container. Most of the participants (66.7%) stored the sublingual GTN in amber colour glass bottles while others stored in plastic containers and PVC envelopes. It was also found that only 52.1% of patients were conscious on when to seek medical consultation other than regular follow-up or prescription refilling. (Azuati et al., 2014) On the other hand, a study with title Sublingual Glyceryl Trinitrate use among patients with coronary heart disease and calling for help during chest pain recruited thirty-five patients. A questionnaire was sketched to assess GTN medicines taking behaviour. It was visible only 43.0% of patients knew the GTN rule. The women had waited less than men in calling for help and also, they were less likely to use GTN during angina pain. (Giannoudia et al., 2014)

Furthermore, a study was aimed to measure the usage of sublingual GTN tablets among CAD patients. The mean use score was 3.7 ± 1.4 with an observed range of 0 to 5. 81% of subjects (n=77) disclosed that they carried sublingual Nitroglycerin all the times with them. 4.2% of subjects had prescribed with for Nitroglycerin and never had used it. But 25.3% were identified utilizing GTN tablets for every chest pain episode. Few numbers of patients used sublingual Nitroglycerin for symptoms other than angina pain like fast heart beating, slow heart beating, nervousness, dizziness and others. But the cardiac related quality of life was observed to be good among the participants. (L P Kimble and Kunik, 2000) Fifty-two patients from a cardiac ward or coronary care unit were found with mean use score 3.68 (SD=1.12, range 1-5) and statistically significant difference was not observed between males and females. Most of the patients claimed that they had not received any advice on sublingual GTN for more than one year. Nearly all the participants (96.4%) took

their sublingual GTN in an appropriate body position – sitting or lying down. Half of the total participants carried their drug by protecting it from heat. The gender difference was remarkable. The results of the study emphasized that patients require education on self - administration of sublingual GTN. (Fan, Mitchell and Cooke, 2009)

Influence of Socio demographic factors

A study in Malaysia included with 61.5% of males revealed that men were carried their tablets in an inappropriate way where the drugs can be affected by their body heat and also half (49.0%) of them carried it in an inappropriate containers like plastic containers and PVC envelopes. The gender had a statistical significance with Person Chi- square test ($p=0.007$) (Azuati et al., 2014) A study by Kimble and Kunik, depicted mean age of 63 ± 11 years, the demographic variables including age, ethnicity, marital status, educational level and employment status and clinical characteristics were used as predictors of GTN knowledge and use. Elderly ($p=0.04$), male ($p=0.0001$) were independent predictors of poorer GTN knowledge. In case of GTN use, only Gender ($p=0.001$) was statistically significant, denoting men used GTN tablet in a manner less consistent with standard guidelines than women. (L P Kimble and Kunik, 2000). In another study, the observed total mean score for knowledge regarding GTN usage was 3.98 (SD=1.21, range 1-7). Females got higher mean score than males. However the study illustrated no significant difference between the knowledge score of male and female. The mean use score for males was 3.43(SD=0.94, range 1-4) and for females was 3.93(SD=1.27, range 2-5). But there was no significant difference between males and females ($p=0.25$) Most of the females carried the sublingual GTN tablets correctly by keeping them inside their hand bags. This gender difference

was significant ($p<0.000$) (Fan, Mitchell and Cooke, 2009)

METHODOLOGY

Design

This was a hospital based descriptive cross-sectional study among the patients attending Cardiology clinic at Teaching Hospital, Jaffna. Data were collected via an interviewer administered questionnaire lasted for 15 minutes.

Study setting and sampling

The patients receiving Sublingual Glyceryl Trinitrate at Cardiology clinic, Teaching Hospital Jaffna were recruited in this study. It was identified that patients are attending to Cardiology clinic for two days in a week and around 90 patients were found receiving sublingual GTN tablets during a clinic day. For a month, nearly 720 patients were found. The first person was selected by simple random sampling technique and continued with systematic sampling. An interviewer administered questionnaire was used for every selected patient. The voluntary participation was ensured. The purpose of this study was explained to participants and written consent was obtained from them. An interviewer administered questionnaire lasted for 15 to 20 minutes was utilized for interviewing each patient.

Study instrument

An interviewer administered questionnaire was used to collect data. The questionnaire was developed in English and validated by three experts namely Dr. P. Lakshman, Consultant Cardiologist, Teaching hospital Jaffna, Dr. V. Sujanitha, Consultant Physician, Teaching Hospital, Jaffna and Dr. T. Kumanan, Consultant Physician & Senior Lecturer, Department of Clinical Medicine, Faculty of medicine, University of Jaffna. Later questionnaire was translated into Tamil and Sinhala languages. The questionnaire consisted of

three sections namely A, B and C. Section A consisted six questions regarding socio-demographic factors (Gender, age, marital status, ethnicity, religion and educational level) of patients. On the other hand, Section B and C are designed to collect data on knowledge and practice of Sublingual GTN tablet respectively. The section B consisted of thirteen questions regarding indications of the drug, mode of action, method of administration, side effects of the drug, storage of the drug and drug interactions. The section C consisted of ten questions to gather data on practice.

DATA ANALYSIS

The collected data were entered into SPSS (Statistical Package for Social Sciences version 22). The research problems, specific objectives, and variables were analysed. In order to assess the knowledge, score was provided for each question of knowledge sections. Each correct response was offered with one mark where incorrect or “do not know” response was given with zero mark. Total of twenty marks was provided for the knowledge section. The level of knowledge was categorized as “Good knowledge” and “Poor knowledge”. The score from 11 to 20 was considered as good knowledge and the score from 0 to 10 was considered as poor knowledge. The responses of each question were described in frequency and percentage individually. The influence of socio demographic factors on knowledge and practice regarding the usage of sublingual GTN were determined by Chi-square test and 95% of confidence interval was set for the test whereby the result was significant if p value < 0.05.

Ethical considerations

Research proposal was submitted to Ethical Review Committee through, the coordinator for pharmacy, Head, Unit of

Allied Health Sciences and the Dean, Faculty of Medicine, University of Jaffna and the approval was obtained to carry out this study. Permission for the data collection for this study was obtained from the Director, Teaching hospital, Jaffna. The purpose of the study was explained and a written consent was received. Privacy of the patients was ensured by interviewing the participants in a solitary place away from other patients

RESULTS

The study approached 268 participants, but 256 participants were responded, whereas the response rate was 95.5%. Majority were (67.2%) male. The patient’s age range was between 40 to 85 years with mean age of 66.3 (± 8.88) years. One fourth of them were below 60 years and remaining were above 60 years. Most subjects were Sri Lankan Tamil (99.2%), married (82.8%) and followed Hinduism (82.4%). Greater number (40.6%) finished studying from grade 6 to 10 while only 2.0% were degree holders.

Table 1 Distribution of socio demographic factors (n=256)

| Socio demographic factors | Frequency | Percentage (%) |
|-----------------------------------|-----------|----------------|
| Gender | | |
| Male | 172 | 67.2 |
| Female | 84 | 32.8 |
| Age (in years) | | |
| Below 60 | 64 | 25.0 |
| Above 60 | 192 | 75.0 |
| Marital status | | |
| Unmarried | 5 | 2.0 |
| Married | 212 | 82.8 |
| Divorced | 1 | 0.4 |
| Widowed | 38 | 14.8 |
| Ethnicity | | |
| Sri Lankan Tamil | 254 | 99.2 |
| Sri Lankan Moors | 2 | 0.8 |
| Religion | | |
| Hinduism | 211 | 82.4 |
| Christianity | 43 | 16.8 |
| Islam | 2 | 0.8 |
| Lastly attained Educational Level | | |
| Grade 1 to 5 | 54 | 21.0 |
| Grade 6 to 10 | 104 | 40.6 |
| O/L | 69 | 27.0 |
| A/L | 24 | 9.4 |
| Undergraduate | 5 | 2.0 |

Knowledge on GTN

Most (94.1%) of the total participants knew that GTN tablets were used to get relief from chest pain while very few (6.6%) were informative on its usage as prophylactic. Less than half (36.7%) of them knew that it causes headache, 19.1% dizziness and 3.5% Nausea. Also participants (38.7%) were clear that lying down and spitting the tablets (16.0%) immediately might reduce headache and other side effects. It was unambiguous that whole population were knowledgeable on correctly placing the tablet under tongue in an appropriate sitting or lying down position (92.6%). Only less than half of the participants were clear cut on taking maximum of three tablets (47.2%) with a

time interval of five minutes (44.9%). The delay in rushing hospital even after the persistence of symptoms may be detrimental. According to our study larger part of the subjects (92.6%) were crystal clear on that. GTN tablets do have drug – drug interactions with Sildenafil and also it has pathophysiological effect with condition called Anaemia. Only one fourth of the participants had stopped using the drug once they exposed to allergic symptoms. Remaining others were unclear on its interaction. Only one person was aware that the drug should not be followed if there is severe anemia and four persons were conscious on not to use Sildenafil together with GTN tablets. Storage of drug influences the potency of drug. As GTN tablet is sensitive to light. A marked number of participants had perceived a good knowledge on storing the drug. The tablets were kept in its original amber colour glass bottle (98.4%) and in cool and dark place (94.1%). The tablets should be replaced every 8 weeks after first opening of the bottle. It is because the efficacy of the drug reduces with exposure to light and heat. Half of the sample (48.0%) had changed the tablets every eight weeks and the remaining (46.5%) notified 4 weeks.

Table 2 Distribution of knowledge (n=256)

| Level of knowledge | Frequency | Percentage (%) |
|--------------------|-----------|----------------|
| Good Knowledge | 58 | 22.7 |
| Poor Knowledge | 198 | 77.3 |

Table 3 Distribution of level of knowledge among participants (n=256)

| Category | Frequen cy | Percentage (%) |
|--|---------------|----------------|
| Indications | 241 | 94.1 |
| Mode of Action | 19 | 7.4 |
| Method of administration | 255 | 99.6 |
| Maximum number of tablets per pain episode | 121 | 47.2 |
| Time interval between two tablets | 115 | 44.9 |
| Actions to be taken if chest pain persists | 237 | 92.6 |
| Appropriate Body position | 237 | 92.6 |
| Renewal of tablets | 123 | 48.0 |
| Storage container | 252 | 98.4 |
| Storage place | 241 | 94.1 |
| Side effects | 94 | 36.7 |
| Actions to avoid side effects | 99 | 38.7 |
| Interactions of GTN | 64 | 25.0 |

The overall knowledge was categorized as good knowledge and poor knowledge according to a cut off value of 50%. The total score provided for the knowledge content was 20. The marks above 10 was named good while below as poor knowledge. In this study, more than two third (77.3%) of the entire participants showed poor knowledge while 22.7% showed good knowledge. More than three fourth of both males and females possessed poor knowledge. The participants off all the age group as well as married and unmarried had identical level of knowledge. The subjects, finished studying above Ordinary Level (O/L) had good knowledge than those studied up to Ordinary Level (O/L). A statistically significant difference was observed between level of knowledge and lastly attained educational level (p value=0.011).

Practice on GTN tablets

The practice regarding usage of GTN tablets among subjects was identified via questions about carrying GTN tablets all

the times, renewal of tablets, body position, usage of tablets for other symptoms, way of acquiring tablets and source of information regarding the GTN tablet. More than three fourth (81.2%) kept their sublingual GTN with them at all time. Compare to those studied above O/L, a greater number of participants from other group skipped taking GTN tablets with them. All of them carried their tablets in its original container without replacing it into any other plastic bottles or envelopes. Majority (72.5%) kept the bottle inside the bag while 27.5% carried inappropriately in their pockets. Body heat might affect the potency of the drug and may be ineffective when it is urgently administered. Only few participants (11.7%) told that their GTN tablets had finished before their next clinic visit and 70.0% of them had obtained new tablets from private pharmacies while rest waited until next clinic visit. None of the participants had taken GTN tablets for symptoms other than chest pain. GTN tablets do have another indication, prophylaxis. But majority (95.7%) of the participants were unknown regarding this

and were skipped taking tablets before doing any exercises or heavy works. A question was raised on the source of information. Physician, Nurses and Pharmacists are responsible professional in providing directions regarding usage of medicine. Most (93.8%) of participants specifically mentioned physician while half (55.1%) of the participants mentioned Pharmacist.

DISCUSSION

Sublingual GTN is commonly prescribed for self-administration on an as needed for Angina. Patient's misunderstanding on the proper usage of Glyceryl Trinitrate may lead to incorrect usage and therapeutic failure. In this study majority of the participants were male (67.2%). This is similar to other differential studies (Gallagher et al., 2010; Fan, Mitchell and Cooke, 2009; Gallagher et al., 2010; Azuati et al., 2014). The study participants age range was between 40 to 85, with mean age of 66.27 (± 8.88) years which is almost similar to the study by (Gallagher et al., 2010) where mean age was 62.65 (SD= 12.58). Majority of the participants were Sri Lankan Tamil and most of them were Hindus. More than three fourth (82.8%) of the participants were married. It is consistent with the studies where majority of the respondents were married (Kimble and Kunik, 2000; Fan, Mitchell and Cooke, 2009). Most of the participants (88.7%) were studied up to Ordinary Level (O/L) and it is in line with the study conducted in Malaysia (Azuati et al., 2014) but in our study, there were only 2.0% of participants were finished Undergraduate studies which is contrast to others studies (Gallagher et al., 2010; Kimble and Kunik, 2000) where more number of participants were degree holders.

The study revealed that, majority (77.3%) of the participants had poor knowledge and only 22.7% had good

knowledge regarding the usage of sublingual Glyceryl Trinitrate tablets. It is in line with a study, where 22% of participants were manifested with good knowledge, 37% with poor knowledge and 41% with poor to moderate knowledge score. (Azuati et al., 2014). Another study, suggested that knowledge of sublingual GTN was moderately consistent with standard patient education guidelines, where the mean knowledge score was 5.1 (± 1.7) with an observed range of 0 to 7 (Laura P. Kimble and Kunik, 2000). In this present study, both male and female were represented with approximately similar level of good knowledge. However, there was no any statistically significant difference between both level of knowledge and gender. It is contrast with a study where women got high mean score than men. But, like our study, there was no statistically significant difference between level of knowledge and gender ($p=0.71$) (Fan, Mitchell and Cooke, 2009). In this current study, the level of knowledge was good in participants, studied above O/L. But 79.7% of the participants, studied up to O/L were possessed with poor knowledge regarding usage of sublingual Glyceryl Trinitrate tablets. Thus, there was a statistically significant difference between level of knowledge and lastly attained education ($p=0.011$)

Majority (94.1%) of the participants were known that sublingual Glyceryl Trinitrate tablets provide relief from chest pain. It is similar to the study conducted in Malaysia, where 97% of participants were mentioned the correct indication of the drug (Azuati et al., 2014). Only 6.6% participants of this study knew that sublingual Glyceryl Trinitrate tablets can be used as prophylaxis for chest pain. 7.4% of the entire participants were correctly mentioned the mechanism of action of sublingual Glyceryl Trinitrate tablets, that it dilates the blood vessels and facilitates the blood flow. It is incoherent

with other differential studies. The studies conducted by (Azuati et al., 2014; Fan, Mitchell and Cooke, 2009) showed 24% and 36.6% respectively. Almost 99.6% of the participants of this study were accurately replied that sublingual Glyceryl Trinitrate tablets should be kept under the tongue during administration. Regarding the maximum number of sublingual Glyceryl Trinitrate tablet per episode of chest pain, only 47.2% of the participants were answered correctly, that it was three. It was congruent with a study, where 48.8% of participants were responded correctly (Fan, Mitchell and Cooke, 2009). But higher percentages of participants were answered correctly in other studies conducted in Malaysia and Australia. Among the participants 69.0% were responded correctly (Gallagher et al., 2010b). Only 36.5% of the entire study population did not know that the maximum number of tablet is three (Azuati et al., 2014). The study by (Bailie and Kay, 1988) notified that only 62% knew what to do if the first tablet was ineffective, but 88% did not know the maximum dose.

Among the participants 44.9% specified the correct time interval, five minutes between consecutive Glyceryl Trinitrate tablets. The findings of this study is in line with similar study by (Fan, Mitchell and Cooke, 2009), where 48.8% mentioned correct answer. But it is contrast with a study with 71% of correctly answered participants (Gallagher et al., 2010b). The study also revealed that majority (92.6%) of the participants were aware on calling for help or rushing to hospital if the chest pain persists even after taking maximum number of sublingual Glyceryl Trinitrate tablets. It is consistent with a study where 80.0% of the study population suggested calling for an ambulance if Glyceryl Trinitrate tablets did not relieve the symptoms (Gallagher et al., 2010). Almost 92.6% of the participants were mentioned that sitting or lying down posture was the appropriate body position to take

sublingual Glyceryl Trinitrate tablets. It is inconsistent with studies (Fan, Mitchell and Cooke, 2009 ; Gallagher et al., 2010) which depicted less percentage of participants, 78% and 87% respectively. 36.7% of the participants of this study were developed headache and 19.1% were known with dizziness after the administration of sublingual Glyceryl Trinitrate tablets. It is coherent with a study where, only 28% of respondents correctly answered regarding adverse effects. (Azuati et al., 2014). Another study revealed that one third were reported with headache and dizziness at the first time and around 30% of them were changed the form of Glyceryl Trinitrate usage. Either change from tablet to spray or from spray to tablet (Fan, Mitchell and Cooke, 2009). Here, 38.7% and 16% of participants were notified that lying down or sitting down and spitting the tablets immediately after the reliefs from chest pain were effective in reducing the side effects respectively. This is contrast with a study where, only 4% of the respondents were known about the way to reduce headache. (Bailie and Kay, 1988)

In the study population, 48% of the participants were correctly pointed out that the sublingual Glyceryl Trinitrate tablets should be replaced every eight weeks. This result is almost identical with another study where, only half of the participants were known about it correctly even the labels of Glyceryl Trinitrate bottles carry an expiry date of eight weeks after the bottle is first opened (Bailie and Kay, 1988). Among the respondents 56.2% were not aware regarding the replacing of new sublingual Glyceryl Trinitrate tablets. (Azuati et al., 2014). In this present study, majority (98.4%) of the participants were precisely mentioned that sublingual Glyceryl Trinitrate tablets should be stored in its original amber colour bottle, as well as in cool and dark place was the appropriate place to keep the Glyceryl Trinitrate bottles. It is greater

than the study by (Gallagher et al., 2010) where only 67% participants were known to keep the medication in its original container. Study by (Bailie and Kay, 1988) depicted that a participant stored the Glyceryl Trinitrate tablets loosely wrapped in a handkerchief.

In this study, one fourth (25%) of the participants were aware on stop using GTN tablets once the allergy to Glyceryl Trinitrate tablets were detected and only 1.6% were familiar with avoid using Sildenafil / Viagra together with Glyceryl Trinitrate tablets. This is inconsistent with a study, where one third (33%) of the respondents were known that Sildenafil should not be used in combination with sublingual Glyceryl Trinitrate tablets (Gallagher et al., 2010). The practice regarding the usage of sublingual Glyceryl Trinitrate tablets was described among the study participants. Majority (81.3%) of the participants were carried GTN tablets always with them and entire participants were carried it in its original container. It is congruent with a study conducted in Malaysia, where 80% of the participants carried Glyceryl Trinitrate tablets along with them, but in contrast only 66.7% of them carried it in its original container while, some (4.2%) stored it in plastic container and 29.2% stored in PVC envelope supplied in pharmacy (Azuati et al., 2014). In another study also, 81% of subjects carried Glyceryl Trinitrate tablets at all times (Laura P. Kimble and Kunik, 2000). Around 85.7% of males and 78.6% of females carried Glyceryl Trinitrate tablets, but only 82.1% of participants were used the appropriate container to carry it (Fan, Mitchell and Cooke, 2009). During carrying, all the females were carried the Glyceryl Trinitrate tablets in their handbags or bags in a way to protect it from the sunlight. But 41.3% of the males were kept their tablets in pocket while rest of the others kept it inside the bag. The findings of this study is in line with a study by (Azuati et al., 2014), where

men were more likely to carry their Glyceryl Trinitrate tablets in a manner that was not protected from body heat. 49% of them carried the tablets inside their clothes pocket. The present study is also consistent with a study, where most of the females transported the Glyceryl Trinitrate tablets correctly. (Fan, Mitchell and Cooke, 2009)

In this study, none of the participants were replaced the Glyceryl Trinitrate tablets from its original container. It is incoherent where, 35% of the respondents replaced and carried the tablets in an inappropriate container such as plastic bottle, pill box and plastic envelopes (Azuati et al., 2014). Among the participants 98.4% were administered the tablet in sitting or lying down position. It is almost identical to a study where, 96.4% of the eligible participants took the tablet in the appropriate body position, sitting position (Fan, Mitchell and Cooke, 2009). None of the participants of this study were administered the sublingual Glyceryl Trinitrate tablets for any symptoms other than chest pain. It is incoherent to a study by (Laura P. Kimble and Kunik, 2000), where 32.6% of the respondents were reported using sublingual Glyceryl Trinitrate tablets for symptoms like heart beating fast, heart skipping beats, shortness of breath, nervousness and dizziness other than chest pain.

Majority of the participants (88.3%) did not complained regarding finishing of sublingual Glyceryl Trinitrate tablets before their next clinic visit. Among rest of the others 70.0% were obtained new tablets from private pharmacies while remaining others waited until next clinic visit. However, there was no statistically significant difference between finishing of sublingual Glyceryl Trinitrate tablets and socio demographic factors of participants. In this study only 4.3% were used Glyceryl Trinitrate tablets before doing exercises or heavy works. It is in line to a study, where majority of the patients

reported lack of information on usage of tablet to prevent the emergence of angina (Azuati et al., 2014). In this present study, 93.8% of participants were stated that physicians advised them regarding the usage of sublingual Glyceryl Trinitrate tablets and 55.1% were mentioned pharmacists. Similar study suggests that Doctors (78.1%) were the most frequent providers of instructions about sublingual Glyceryl Trinitrate tablets. (Fan, Mitchell and Cooke, 2009). Among the participants 80% said that healthcare professionals advised them about the drug (Giannoudia et al., 2014). But it is contrast with the study conducted in Australia, where the health professionals who gave instructions most often were nurses (37%) and Doctors (24%) (Gallagher et al., 2010)

CONCLUSION

The findings of the study revealed that, majority (77.3%) of participants had poor knowledge regarding the usage of sublingual Glyceryl Trinitrate tablets. At the same time, there was a statistically significant relationship between the level of knowledge and the lastly attained education level of the participants. More than three fourth of the patients carried GTN tablets together with them. Sublingual Glyceryl Trinitrate tablets is administered on an “as needed” basis, thus educational emphasis is not given to this medication as like other medications in the medical regimen. But still it remains as first line drug therapy for many patients. According to this study, it is crystal clear that the overall knowledge of the patients on usage of GTN tablet is poor. The results of this study proves that, the patients need to know more about self- administration of sublingual Glyceryl Trinitrate tablets. The level of knowledge could be improved by more frequent reinforcement of patient education especially in areas of maximum dosage per pain episode, time sequencing of tablet and way of carrying tablet.

Written information is generally considered to be beneficial in increasing patient’s knowledge especially when combined with oral information. Also giving advice regarding the usage of sublingual Glyceryl Trinitrate to the patients, together with their spouse or other family member will be effective in managing angina, when it gets worse.

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