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Effect of glycerine magnesium Sulphate on chemotherapy induced infusion phlebitis among cancer patients in selected hospitals of Gujarat

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Abstract
IV infusion therapy is the principal modality for administration of anticancer drugs. According to British Journal of nursing (2022), Phlebitis is a serious health problem that affects a large proportion of hospitalized cancer patients receiving intravenous therapy. The average incidence of phlebitis was 61.5%. The main aim of this study is to evaluate the effect of glycerine magnesium sulphate on chemotherapy induced infusion phlebitis among cancer patients in selected hospitals of Gujarat. In the present study pre-experimental (one group pre-test post-test) research design was used. The study was conducted in selected hospitals of Gujarat state. The non-probability purposive sampling technique was used for selecting 30 samples with chemotherapy induced infusion phlebitis. Data were collected with the help of two sections. Section A includes question regarding demographic variables. Section B includes data regarding clinical variables and a modified VIP score. Modified VIP Score was prepared to assess the chemotherapy induced infusion phlebitis.

Objectives

1. To assess the pre-test level of chemotherapy induced infusion phlebitis among cancer patients in selected hospitals of Gujarat.
2. To assess the post-test level of chemotherapy induced infusion phlebitis among cancer patients in selected hospitals of Gujarat.
3. To determine effect of glycerine magnesium sulphate on chemotherapy induced infusion phlebitis among cancer patients in selected hospitals of Gujarat.
4. To find the association of pre-test level of chemotherapy induced infusion phlebitis among cancer patients with their selected demographic and clinical variables.

Keywords: Cancer patients, chemotherapy, infusion phlebitis, Glycerine magnesium sulphate, modified visual infusion phlebitis (VIP) score, body mass index (BMI), Hospital

Introduction

Cancer is the uncontrolled growth of abnormal cells anywhere in a body. These abnormal cells are termed as cancer cells, malignant cells or tumor cells. According to report from National Cancer Registry Programme, the projected incidence of patients with cancer in India among males was 679,421 (94.1 per 100,000) and among females 712,758 (103.6 per 100,000) for the year 2020.

Once cancer is diagnosed, the patient may require medical treatment and specialized care for months, and often years. The principal modes of therapy are – surgery, radiotherapy and chemotherapy.

Chemotherapy is a drug treatment that uses powerful chemicals to kill fast growing cells in body. Chemotherapy is an effective way to treat many types of cancer. Chemotherapy may be given in several different ways like Intravenous (IV) chemotherapy, Oral chemotherapy, Injected chemotherapy, Chemotherapy into an artery, chemotherapy into the peritoneum/ abdomen, Topical chemotherapy.

IV infusion therapy is the principal modality for administration of anti-cancer drugs for most types of malignant disorders with numbers exceeding 1 million infusions each day worldwide.

The Infusion Nurses Society, National standards of practice (Australia) stated that nurses who administer IV medication or fluid must know its adverse effects and appropriate interventions to be taken before starting the infusion. Hence nurses need to be aware of and consider certain interventions to reduce phlebitis when managing IV therapy in patients.

One of the systematic complications of phlebitis is sepsis, circulatory overload, pulmonary oedema, air embolism, catheter embolism, and shock by rapid infusion. The local complications such as phlebitis, allergic reaction, anaphylaxis, haematoma, venous spasm, nerve tendon, ligament damage, extravasation.

The phlebitis is the inflammation of vessel, and may be classified, according to the predisposing factors, chemistry phlebitis (administration of medications or risk solutions); mechanical phlebitis (which may result from the trauma caused by the catheter in the vessel wall); & infectious phlebitis (caused by contamination of solution at the catheter insertion site and device). As a sign and symptoms can be observed edema, local heat, hyperemia, pain and exudate output at the puncture site. The redness and tenderness may follow the course of the vein under the skin. Low grade fever may accompany superficial and deep phlebitis.

The treatment of the thrombophlebitis consists of applying heat to the painful area and use of over-the-counter non-steroidal anti-inflammatory drugs (NSAID), anticoagulant medications, supportive stocking and bypass surgeries.

According to PMC (US National library of medicine National institute of health) (2017) journal of Rev Lat Am Enfermagem, the incidence of phlebitis was 1.25% while using PIC, & 1.38% post infusion. They also mention that the length of time catheter remains in place influences the appearance of phlebitis, where the incidence of phlebitis was 62.5%.

Phlebitis is an inflammatory condition of vein that may be caused by infection, the presence of a foreign body, fluids or medication given. The intravenous device must be removed and if necessary, re-inserted into another extremity.

According to British journal of nursing (2022), Phlebitis is a serious health problem that affects a large proportion of hospitalized cancer patients receiving intravenous therapy. The average incidence of phlebitis was 61.5%.

According to the standards of intravenous nurse's society the rate of chemotherapy induced phlebitis incidence has been reported as 75%. As per the statistics provided by Gujarat Cancer Research Institute in 2021, it was observed that chemotherapy induced phlebitis incidence was reported about 26%.

It is estimated that approximately half of all patients admitted to the hospital require the insertion of an intravenous cannula into a peripheral vein, usually in the hand or arm, for the administration of intravenous fluids, medications, and blood products. It is the most common invasive clinical procedure performed in hospitals worldwide.

One of the most common complications of peripheral intravenous catheter is phlebitis that up to 75% of hospitalized patients. Maintenance of the patency of these catheters and prevention of phlebitis is an important problem.

According to academic journal of Phrapokklao Nursing College, Chanthaburi, Thailand; titled Phlebitis: Silent Danger prevented by Nursing Care, Phlebitis affects the comfort of patients, the length of stay and the cost of treatment. Nurses are as an important key for preventing and assessing for the presence of phlebitis among patients with peripheral venous cannulation.

The application of magnesium sulphate is done for inflammatory skin conditions. It is also applied to promote healing of wound and also withdraw pus and exudates by osmosis. Magnesia plays an important role with regard to neurochemical transmission and muscular excitability, it reduces striated muscle contractions and blocks peripheral neuromuscular transmission by reducing acetylcholine release at the myoneural junction, inhibits Ca2+ influx through dihydropyridine-sensitive, voltage dependent channels. This accounts for much of its relaxant action on vascular muscle.

Glycerine is an organic compound, which is a polyol compound and is odorless. Glycerine is moisturizing the skin and cleanses. It is also applied to promote healing of wound and ulcers to withdraw pus & exudates by osmosis. It's nontoxic, which makes it safe to be used for every individual. It moisturizes the skin and cleanses. It instantly kills all the bacteria as soon as it comes in contact with the bacteria.

Vlerie Harries, Meninir Hughe, Rosie Roberts, *et al*, (2020) quasi1experimental study and developed a chemotherapy induced phlebitis severity scale for patients receiving anthracycline chemotherapy for breast cancer. Total 122 patients were taken for assessments. The reported rates of chemotherapy induced phlebitis vary considerably from 3% to 89%.

K.C.Amuda, Parajuli, P., R. and Mandal G. (2019)quasi1experimental study on effectiveness of magnesium sulphate with glycerine dressing and heparin ointment application on phlebitis patients, Nepal. Regarding effectiveness, there was a statistically significant difference in phlebitis score in both experimental groups after comparison baseline within 8, 16, 32, 40, 48 hours of administration of intervention (P = 0.05). The result revealed that in group I the mean pre-post treatment score of phlebitis were 3.36 and 0.120 respectively In group II the mean pre- and post-treatment scores of phlebitis were 3.0 and 0.28 respectively. It shows that there is more reduction of VIP score in Magnesium Sulphate with Glycerine (MSG) group. So it is revealed that Magnesium Sulphate with Glycerine is more effective than Heparinoid ointment in management of phlebitis.

Alwin T Varghese, KT Moly (2018) quasi-experimental study on effectiveness of MgSo4 with glycerine Vs cold compress on patient with peripheral intravenous cannula induced phlebitis, Kerala. There were 60 subjects in this study. In this study both magnesium sulphate with glycerine (MD=2.1, t29=16.16, p<0.001) and cold compress (MD=1.6, t29=17.59,

p<0.001) were found to be effective in reducing the PIVC induced phlebitis.

H.N Ravindra, K. D Patel (2015) quasi-experimental study to evaluate effectiveness of glycerin magnesium sulphate dressing on phlebitis among patients undergoing peripheral intravenous infusion in selected hospital, Vadodara. There were 60 samples in this study taken. In this study experimental group post-test mean score 1.10, SD was 0.71 respectively. In control group post-test mean score 2.53, SD was 0.78 respectively. The obtained value 7.454 statistically was significant at 0.001 levels. The research study findings revealed that Glycerine Magnesium sulphate dressing is highly effective in decrease phlebitis level to the patients. Thus, from the above listed studies positive outcome, the investigator felt the need to find out the effectiveness of glycerine magnesium sulphate on IV therapy induced phlebitis on cancer patients.

Results

The major findings of the study include

The data were analyzed and interpreted in terms of objectives of the study. Descriptive and inferential statistics methods were used for data analysis. Data were organized and presented in the following manner which includes description of all the aspects. 1. Findings related to demographic data of Samples: The findings of my study as follows: Age (in Years), majority of the samples 10(33.33%) belong to the age group of 45 – 55 years, 08 (26.67%) samples belong to the age group of 36 – 45 years, 7 (23.33%) belong to the age group of 56 years & above and (16.6%) from 25-35 years.

As regard to Gender 19 (63.33%) of the samples were female and 11(36.67%) of samples were male. In Education

Qualification, Equal representation of the illiterate and graduate qualification among samples that is 10(33.33%), 06(20%) samples were illiterate and 4(13.34%) were post graduates. 2. Findings related to clinical data of the samples. The findings of my study as follows: Type of cancer, majority of the samples 12(40%) belong to the breast cancer, 8(26.66%) samples belong to the Leukemia, 5(16.67%) belong to the head and neck cancer and 3 (10%) belong to other diseases, and 2 (6.67%) belong to colorectal cancer. As regard to Body Mass Index 17 (56.66%) of the samples had underweight (120 minutes infusion and 2(6.67%) samples were 30-60 minutes infusion. In administration of chemotherapeutic drug, majority of the samples 12(40%) had doxorubicin (Arthracyclines) drug class, 8(26.67%) had cisplatin (alkalating agent) drug class, 4(13.33%) had Actinomycin-D(plant alkaloids) drug class and 3(10%) equal distribution of 5-Flurro Uracil (anti metabolites) and other drug class each. About days of hospitalization includes majority of patients 17(56.67%) patients admitted for 3-6 days, 08(26.66%) patients admitted for 7-10 days and remain 5(16.67%) patients admitted for 11-14 days. 0.3. Findings related to pre-test levels of chemotherapy induced infusion before intervention of glycerine magnesium sulphate among cancer patients by using modified visual infusion phlebitis score. Modified visual infusion phlebitis score describes that before the intervention of glycerin magnesium sulphate 0(0%) patient had no phlebitis,8(26.66%) patients had a mild level of phlebitis, 15(50%) had a moderate level of phlebitis and 7(23.33%) had a severe level of phlebitis. 4. Findings related post-test levels of chemotherapy induced infusion phlebitis after intervention of glycerine magnesium sulphate among cancer patients by using modified visual infusion phlebitis score. Modified visual infusion phlebitis score checklist describes that after the intervention of glycerin magnesium sulphate 5(15.66%) patients had a no phlebitis, 14(46.66%) had a mild level of phlebitis,11(36.66%) patient had moderate level of phlebitis and 0(0%) patient had severe phlebitis. 4. Findings related to effectiveness of Glycerine magnesium sulphate Application Paired t-test applied between Pre-intervention and post intervention score by Using Modified Visual Infusion Phlebitis score checklist among cancer patients. The mean Pre-test score was 15.3 and the mean post test score was 10.73 with the mean difference of 4.57. The table also represents that the Standard deviation of Pre-test score was 4.03 and Standard deviation of post test score was 3.27. The calculated 't' value was 7.18 and the tabulated 't' was 2.04 at 0.05 level of significance. It revealed that Glycerine Magnesium sulphate application was effective among the samples. This indicates that difference obtained in the mean pre-test score and mean post-test score of Modified Visual Infusion Phlebitis score was real difference and not by chance.

Therefore, the null hypothesis H0 was rejected and research hypothesis H1 was accepted. It revealed that Glycerin magnesium sulphate was effective among the samples. 5. Findings related to association between Pre-test levels of chemotherapy induced infusion phlebitis by Modified visual infusion phlebitis score with demographic and clinical variables: The findings revealed that there was association of the Modified Visual Infusion Phlebitis score such as Gender, Education and size of cannula with the Pre-intervention score of the samples. Hence, the Null Hypothesis (Ho) was being rejected and research Hypothesis (H2) was accepted as there was association between Pre-intervention score with selected Demographic Variables and clinical variables.

Conclusion

The following conclusions could be drawn from the present study findings: In Present study, chemotherapy induced infusion phlebitis is recovered by the administration of glycerine magnesium sulphate. Significant association found between before and after application of the Glycerine magnesium sulphate. The present study evaluates the effectiveness of glycerine magnesium sulphate on chemotherapy induced infusion phlebitis among cancer in selected hospitals of Ahmedabad city. The level of chemotherapy induced infusion phlebitis was mild, moderate and severe before glycerine magnesium sulphate application. After application of glycerin magnesium sulphate, It is evident that the glycerin magnesium sulphate is effective in reducing chemotherapy induced infusion phlebitis. The study also suggested that specific information and skills of administering chemotherapy has to be taught to the nurses and cancer patient in a prevention of phlebitis.

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