1-Introduction

Pain is an unpleasant feeling often caused by intense or damaging stimuli. The International Association for the Study of Pain’s widely used definition states: “Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage.” Pain motivates the individual to withdraw from damaging situations, to protect a damaged body part while it heals, and to avoid similar experiences in the future. As result the patient compliance may be affected as well as it can significantly interfere with a patient’s quality of life and general functioning. Furthermore, nurses have reported numerous incidents of patients experiencing pain at the infusion site when the contents of these potassium chloride minibags were administered with a peripheral venous cannula. Indeed, in a number of instances patients refused further doses because of the pain experienced during the first infusion.

Local side effects related to potassium chloride intravenous administration have included phlebitis or erythema at the injection site and pain with infusion. Local reactions related to intravenous administration of potassium chloride occur in up to 25% of patients. While the pain at the injection site and phlebitis may occur during IV administration of solutions containing 30 mmoL potassium or more per litre. Therefore, it is strongly recommended dilute 40 mmoL or less of potassium chloride in 1 liter of more of intravenous solution and administering this concentration in no less than 1 hour in order to reduce the likelihood of this problem. If the clinical situation is not critical and the patient’s serum potassium is 2.5 mmoL/cm or more, an infusion rate not to exceed 10 mmoL/hour is recommended. Given that hypokalemia is a common occurrence in hospitalized patients and that severe hypokalemia can be life-threatening, it is important that intravenous potassium replacement be carried out with a minimal chance of infusion failure caused by phlebitis, extravasation, or patient refusal because of intolerability. It is also of paramount importance that patients' discomfort be kept to a minimum.

2-Purpose:

To establish the relationship between the intravenous potassium vehicle, concentrations and infusion rate with the severity of the pain.

3-Methodology

3.1 Design

Observational prospective Study

3.2 Inclusion Criteria

1- Receive potassium chloride intravenous
2- Able to be interviewed
3- Adult

3.3 Exclusion Criteria

If the patient has pre-existing local pain, tenderness, or phlebitis.

3.4 Method

A sample of 150 prescriptions (patients) selected randomly. Randomization carried out by using a computerized randomization program to select two prescriptions in daily on different hospital areas and times randomly. A consent form was given for each patient before the interview as shown in figure (2). A data collection forms were then interview surveys were carried out among the patients who are going to receive intravenous potassium treatment using the developed forms. The first form was used to collect the patient and medication data figure (3), while the second form was used to assess the patient pain figure (4). An intravenous cannula should be inserted at least 1 hour before the start of the potassium chloride infusion, and all sites were inspected before the first infusion to ensure that there is no obvious pre-existing local pain, tenderness, or phlebitis. In order to assess the patient pain, a numeric rating scale (NRS) ranging from 1 (no pain) to 10 (worst pain) was used to rate pain at the infusion site. The pharmacist asked patients to rate the severity of pain at the infusion site using the NRS before the start and at 1 hour after the start. The pharmacist also recorded the name and dose of any other drug that was being infused through the same cannula at the same time. At the completion of each mini-infusion, the nurse, inspected the infusion site and recorded any signs of redness or heat. The osmolality and pH of the potassium chloride solutions were determined for 3 samples of each group of solutions. The pH were determined too.

3.1 Statistical test

Linear regression models for comparing unequal means/variances or sample sizes was used to explore the relationship between solution concentrations and infusion rate with the severity of the pain

4-Results

A sample of 150 prescriptions (patients) selected randomly. Patients ages average is 48.27 years. The average potassium level prior infusion was 3.17 mmoL/cm. There were no pre-existing local pain, tenderness, or phlebitis at the site of the infusion, and pain scores before the start of the infusions were 0 (no pain) for all selected patients. The study showed that the association between the concentration and pain is statistically significant (p = 0.048). The lowest infusion rate was 20 mmoL/hour and the highest was 250 mmoL/hour with an average 105.25 mmoL/hour. The study showed that the association between the infusion rate and pain is not significantly (p = 0.006).

5-Limitations

Limitations of this study is the other risk factors not taken into account, such as the cannula used, the anatomical location of the cannula, and the duration of cannulation, which also affect pain at the infusion site.

6-Discussion

The exact mechanism of infusion-related pain and phlebitis is not known. Irritation, inflammation, and damage to the venous endothelium can be caused by the inherent chemical property, pH, or osmolality of the infusion.

7-Conclusion

The association between potassium chloride intravenous concentration with severity of the pain was established. The study showed the importance of initiation of policy for standardization of potassium concentrations as well, as a guideline for treatment of Hypokalemia.