



RESEARCH ARTICLE

EFFECTIVENESS OF FRESH ALOEVERA AND GLYCERINE MAGNESIUM SULPHATE APPLICATION ON PHLEBITIS AMONG CHILDREN

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ARTICLE INFO

Article History:

Received 24<sup>th</sup> April, 2014  
Received in revised form  
16<sup>th</sup> May, 2014  
Accepted 10<sup>th</sup> June, 2014  
Published online 20<sup>th</sup> July, 2014

Key words:

Effectiveness,  
Fresh Aloe vera,  
Glycerinmagnesium sulphate,  
Phlebitis

ABSTRACT

**Introduction:** Majority of children being admitted in hospital become the recipients of intravenous cannulation for various reasons at some stage and fact has been proved that drugs or fluids given through intravenous line has a quick and better response than other routes. Despite the benefits of a peripheral line, the occurrence of phlebitis is at a higher rate. The main aim and objective of the study was to assess and compare the effectiveness of freshaloevera and glycerin magnesium sulphate application on phlebitis.

**Materials and Methods:** Two group pre-test post-test time series design was used for the study. The sample consisted of 60 children who were purposively assigned to fresh aloe vera group(N=30)and glycerinmagnesium sulphate group(n=30). An observation checklist was used as tool for assessing the severity of phlebitis.

**Results and Discussion:** There was a significant difference in mild phlebitis ( $Z=2.16, P<0.05$ ), in moderate phlebitis ( $Z=2.11, P<0.05$ ), in severe phlebitis ( $Z=2.68, P<0.05$ ) in fresh aloe vera and glycerinmagnesium sulphate application based on the level of severity of phlebitis. Thus the study concludes that there was a significant difference in both fresh aloe vera and glycerinmagnesium sulphate group on the severity of phlebitis.

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INTRODUCTION

Health of children has been considered as the vital importance to all societies because children are the basic resources for the future of mankind. Care of children is considered for both the health of the children and for the illnesses that affect their growth and development. Therefore, hospitalization of children for various disorders are increasing with equal increase in different evidenced based treatment modalities. Therefore, alternative methods in treating phlebitis with evidence-based results would be fruitful for future practice. Early action decreases injury of the affected tissue. Fact has been proved that drugs or fluids given through intravenous line has a quick and better response than other routes. Despite the benefits of a peripheral line, the occurrence of phlebitis is at a higher rate. (Fadakar *et al.*, 2009) A descriptive study conducted at University hospital, on 'pre-disposing factors of phlebitis in patients with peripheral intravenous catheters', in Turkey. Among 568 IV sites observed, 355 patients had IV catheter-related complications. Using a phlebitis evaluation scale, the degree of phlebitis was observed. More than half (54.5%) of the catheter sites had phlebitis. This study concluded that

phlebitis not only causes sepsis, pain, additional diagnostic investigations, treatments, increased duration of hospitalization. (Usuloy and Mete 2008)

Aloe vera contains 6 antiseptic agents: Lupeol, salicylic acid, urea nitrogen, cinnamonic acid, phenols and sulfur. They all have inhibitory action on fungi, bacteria and viruses. Glucomannan, a mannose-rich polysaccharide, and gibberellin, a growth hormone, interacts with growth factor receptors on the fibroblast, thereby stimulating its activity and proliferation, which in turn significantly increases collagen synthesis after topical Aloe vera. (Surjushe *et al.*, 2008) Aloe vera provides 20 of the 22 human required amino acids and 7 of the 8 essential amino acids. It also contains salicylic acid that possesses anti-inflammatory and antibacterial properties. Lignin, an inert substance, when included in topical preparations, enhances penetrative effect of the other ingredients into the skin. Saponins that are the soapy substances form about 3% of the gel and have cleansing and antiseptic properties. (Surjushe *et al.*, 2008) Magnesium sulfate (or magnesium sulphate) colorless viscous liquid. It is an inorganic salt (chemical compound) containing magnesium, sulfur and oxygen, with the formula  $MgSO_4$ . Glycerin is an organic compound, which is a polyol compound and is odorless. It moisturizes the skin and cleanses. It instantly kills all the bacteria as soon as it comes in contact with the bacteria. It seems to be very effective for cleaning heavily infected ulcers and wounds. It is applied to

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inflammatory skin conditions such as boils and carbuncles. It is also applied to promote healing of wound following surgery and for highly infected wounds and ulcers to withdraw pus and exudates by osmosis. It is non-toxic, which makes it safe to be used as skin products manufactured specifically for children and babies. (Glycerine Uses 2011)

## MATERIALS AND METHODS

This study was conducted in PICU and pediatric ward of Father muller medical college hospital. Hospitalized children between the age group of 1- 16 years with phlebitis were selected as subjects. Purposive sampling technique was used. Sample consisted of 60 subjects who were equally assigned to fresh aloe vera group and glycerine magnesium sulphate group. Two group pre-test post-test time series design was used for the study. Ethical clearance from institution and informed consent from parents was obtained prior to data collection. Before the actual application, a hypersensitivity test was done on the inner forearm of the child with two drops of aloe Vera paste prepared. After fifteen minutes the child was assessed for any allergic reactions on the skin to withhold the intervention. But none of the subjects developed any hypersensitive reactions. Thus fresh aloe vera was further applied on the skin with a gauze dressing on children with phlebitis every fourth hourly, till the complete absence of phlebitis. Readily available glycerine magnesium sulphate, was applied over the site of phlebitis with a gauze dressing and changed every fourth hourly, till the complete absence of phlebitis, in glycerine magnesium sulphate group.

The intervention in both the groups were carried out until the complete reduction/ absence of phlebitis. Data was collected with an observation checklist as a tool to assess the severity of phlebitis (pre-test) and after the intervention every fourth hourly (post-test). Mann Whitney 'z' test was used to assess and compare between the groups at  $p > 0.05$  level of significance. Chi-square and Fisher's exact test to assess association.

## RESULTS

In mild phlebitis, fresh aloe vera application was effective on edema with mean hours ( $\bar{x} = 7$ ), in moderate phlebitis, it was effective on movement of extremity with mean hours ( $\bar{x} = 12.8$ ), in severe phlebitis it was effective with mean hours ( $\bar{x} = 10.8$ ) erythema color and erythema size. Based on the level of severity, fresh aloe vera application was more effective in mild phlebitis with mean hours ( $\bar{x} = 14.40$ ) and on severe phlebitis with mean hours ( $\bar{x} = 21.20$ ) than in moderate phlebitis with mean hours ( $\bar{x} = 24.40$ ). In mild phlebitis, glycerine magnesium sulphate application was effective on erythema size with mean hours ( $\bar{x} = 4.40$ ), in moderate phlebitis, it was effective on movement of extremity with mean hours on edema ( $\bar{x} = 13.14$ ) and in severe phlebitis, it was effective on erythema color and size with mean hours ( $\bar{x} = 17.6$ ). Based on

**Table 1. Effectiveness of Fresh Aloe vera application based on the level of severity of phlebitis**

| N=30     |                          |                     |                     |       |                    |
|----------|--------------------------|---------------------|---------------------|-------|--------------------|
| Group 1  | N (total no of patients) | Minimum hours taken | Maximum hours taken | Mean  | Standard deviation |
| Mild     | 10                       | 4                   | 20                  | 14.40 | 4.695              |
| Moderate | 10                       | 12                  | 40                  | 24.40 | 8.099              |
| Severe   | 10                       | 16                  | 36                  | 21.20 | 6.812              |
| Total    | 30                       | 4                   | 40                  | 20.00 | 7.719              |

**Foot note:** The data in Table 1 shows Fresh Aloe vera application was more effective in mild phlebitis with mean hours of ( $\bar{x} = 14.40$ ) and on severe phlebitis with mean hours of ( $\bar{x} = 21.20$ ) than in moderate phlebitis with mean hours of ( $\bar{x} = 24.40$ ).

**Table 2. Effectiveness of Glycerine magnesium sulphate application based on the level of severity of phlebitis**

| N=30     |                          |                     |                     |       |                    |
|----------|--------------------------|---------------------|---------------------|-------|--------------------|
| Group 2  | N (total no of patients) | Minimum hours taken | Maximum hours taken | Mean  | Standard deviation |
| Mild     | 10                       | 4                   | 24                  | 9.60  | 5.400              |
| Moderate | 10                       | 8                   | 40                  | 21.20 | 9.987              |
| Severe   | 10                       | 20                  | 40                  | 31.20 | 7.005              |
| Total    | 30                       | 4                   | 40                  | 20.67 | 11.654             |

**Foot note:** The data in Table 2 shows Glycerine magnesium sulphate application was more effective in mild phlebitis with mean hours of ( $\bar{x} = 14.40$ ) and moderate phlebitis with mean hours of ( $\bar{x} = 21.20$ ) than severe phlebitis in terms of mean hours.

**Table 3. Comparison between the effectiveness of Fresh Aloe vera and Glycerine magnesium sulphate application based on the level of severity of phlebitis**

| N=60              |                |           |                          |           |                 |                |                        |         |  |
|-------------------|----------------|-----------|--------------------------|-----------|-----------------|----------------|------------------------|---------|--|
| Level of severity | Aloe vera Mean | Group S.D | Glycerine magnesium Mean | Group S.D | Mean difference | Standard error | Mann Whitney 'Z' value | P value |  |
| Mild              | 14.40          | 4.695     | 9.60                     | 5.400     | 4.800           | 2.263          | 2.16                   | .031    |  |
| Moderate          | 24.40          | 8.099     | 21.20                    | 9.987     | 3.20            | 4.066          | 2.11                   | .038    |  |
| Severe            | 21.20          | 6.812     | 31.20                    | 7.005     | 10.00           | 3.090          | 2.68                   | .007    |  |

$p > 0.05$ , 'Z' table value = 1.960

**Foot note:** The data in table 3 shows that there was a significant difference between Fresh Aloe vera and Glycerine magnesium sulphate based on the level of severity of phlebitis.

the level of severity, glycerine magnesium sulphate application was more effective in mild phlebitis with mean hours of ( $\bar{x}$  =14.40) and moderate phlebitis with mean hours of ( $\bar{x}$  =21.20) than severe phlebitis in terms of mean hours.

### Comparison between freshaloevera application glycerine magnesium sulphate application

Comparison was done between fresh aloevera and glycerinmagnesiumsulphate on each item of phlebitis with level of severity using Mann Whitney 'Z' test. In mild phlebitis the freshaloevera was effective on temperature at site ( $Z=2.54$ ,  $p>0.05$ ) and pain ( $Z=2.04$ ,  $p>0.05$ ) and glycerinmagnesium sulphate was effective in other domains of mild phlebitis. In moderate phlebitis, both fresh aloevera and glycerine magnesium sulphate was equally effective. In severe phlebitis, shows fresh aloevera ( $Z=2.27$ ,  $p> 0.05$ ) was effective in edema and palpable venous cord and glycerine magnesium sulphate was effective in other parameters.

## DISCUSSION

In the present study, both in fresh aloevera group (36.7%) and glycerinmagnesium sulphate group (40%), majority of the subjects were in the age group of 6-12 years. Majority of the subjects (60%) were males in freshaloevera group and there were equal number (50%) of male and female subjects in the glycerine magnesium sulphate group. Majority of the subjects were under medical diagnosis (76.7%) in fresh aloevera group and (53.3%) in glycerine magnesiumsulphategroup. Most of the subjects (76.7%) in freshaloevera group and inglycerinemagnesiumsulphate group (93.3%) had cannula for the purpose of both IV fluids and IV injections. Majority of the subjects (43.3%) developed phlebitis on the right upper extremity in freshaloevera group and in glycerinmagnesium sulphate group there were equal number of subjects (50%) who developed phlebitis in upper and right and upper left extremity. In both freshaloevera and glycerine, magnesiumsulphate group majority of the subjects (50%) developed phlebitis within 24-48hrs after IV cannulation. Comparison was done between freshaloevera and glycerine magnesium sulphate on level of severity using Mann Whitney 'Z' test.

Fresh aloevera and glycerin emagnesium sulphate application had a significant difference on phlebitis, where the computed value in mild ( $Z=2.263$ ), moderate ( $Z=4.06$ ), severe ( $Z=3.09$ ) was greater than the table value ( $Z=1.960$ ).

### Recommendation

Similar study can be done on a large sample size Comparison of intervention on a particular age group can be done. Comparison of intervention on any one level of severity can be done.

### Conclusion

The study shows it is effective, non- invasive, simple, cost effective, with rare side effects, painless, used and cooling effect of the intervention on the site when applied, thus gaining co-operation for repeated applications.

### Acknowledgement

I owe my thanks to management, guide, co-guide, statistician, all teaching faculties and patients.

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