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Analgesic Effect of Distraction during Venipuncture in Children with Thalassemia

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Abstract

Background: Pain is described as the fifth vital sign, and inadequate pain management is linked to numerous immediate and long-term negative outcomes. Venipuncture is one of the most painful medical procedures in children. Distraction is one of the most effective ways to relieve pain. Reducing patients' pain is important for all nurses for many reasons. Unnecessary pain can damage the nurse-patient relationship, whereas knowledge of alternative techniques can improve patient care and satisfaction.

Objective: The purpose of this quasi-experimental study was to test the analgesic effect of distraction during venipuncture in children with thalassemia.

Materials and methods: Forty patients (6–12 years) who were suffering from major thalassemia and required venipuncture were randomized into distraction group (n = 20, regular breathing exercise) and control group (n = 20, without any intervention). The pediatric pain behavioral symptoms and numeric pain rating scale were used to assess pain caused by venipuncture.

Results: The mean pain score based on the numerical scale was 5.60 ± 3.13 in the control group and 1.85 ± 1.42 in the breathing exercise group (p=0.0001), and the mean score of behavioral pain symptoms was 3.80 ± 2.80 in the control group and 0.96 ± 0.75 in the breathing exercise group (p=0.0001).

Conclusion: Distraction was demonstrated to be effective in reducing pain among children undergoing venipuncture. This intervention requires minimum effort and time and is a convenient nursing intervention that might be used in clinical settings.

Keywords: Pain, Thalassemia, Distraction, Children.

Introduction

Thalassemia is the most common genetic disorder, and is caused by impaired synthesis of one or more of the globin polypeptide chains [1]. Major thalassemia will remain to be one of the major health problems for at least the next few decades, particularly in developing countries [2]. It is estimated that 1.5% of the world's population are carriers of beta thalassemia with an estimated 60,000 new cases being born each year. The Southeast Asia region (which includes India, Thailand and Indonesia) accounts for 50% of world carriers [3]. In Iran, this disease has the highest incidence in the northern and southern provinces of the country. It is more common in Khuzestan, Fars, Bushehr, Hormozgan, Sistan-Baluchestan and Kerman provinces compared to other areas [1]. Currently, about three million people in Iran carry defective genes and about 25 thousand patients with thalassemia major have been identified [4]. Disease such as thalassemia and other chronic debilitating diseases require long and sustained treatment[5]. Nowadays, the advancement of treatment methods has lead to better diagnosis and control of thalassemia which has caused an increase in the

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number of children suffering from this disease who stay alive. The nature of thalassemia is that the children, who suffer from it, should be hospitalized frequently and undergo painful diagnosis and treatment procedures [6].

Venipuncture is commonly seen as one of the most painful and most frequently performed invasive procedures in hospital [7]. In the pediatrics population, it can be one of the most distressing events associated with medical encounters [8]. For thalassemia patients who are repeatedly exposed to the catheter and its pain and anxiety, providing strategies to reduce the pain and make it bearable is very important [6]. Unnecessary pain can damage the nurse-patient relationship, whereas knowledge of alternative techniques can improve patients' care and satisfaction. As advocates for children, nurses are obligated to minimize the emotional and physical effects of painful procedures [9]. There are many different approaches to reduce the acute pain during medical procedures in children, including pharmacological and non-pharmacological measures. One of the non- pharmacological methods to reduce pain is distraction. A variety of different distractors have been used for pain management in children. These include watching cartoons, using party blowers, looking through kaleidoscopes, blowing bubbles, non-procedural talk, listening to short stories, listening to music, puppetry, breathing exercise and virtual reality glasses 1[0, 11]. The goal of distraction is to "refocus attention from threatening, anxiety-provoking aspects of medical treatments to non-threatening and ideally pleasant and engaging, objects or situations." [12]. Sinha et al. evaluated the effect of distraction on pain behavior among children during laceration repair. Patients in the intervention group were given a choice of age-appropriate distractions including music, video games, or cartoons. Patients not interested in these choices were given the option to have a child life specialist read a book or blow bubbles with them. In older children, the use of distraction did not reduce self-reported pain intensity but did reduce self-reported anxiety associated with the procedure. Parental perception of pain in younger children was also reduced with the use of distraction [13]. Considering the variety of distraction methods, studies show that various distraction methods can have a great effect in reducing pain in children [14, 15].

Most studies have dealt with acute painful procedures, such as immunizations [16, 17], or lumbar puncture/ bone marrow aspiration in patients with cancer [18]. The effects of these methods on reducing pain among children who suffer from thalassemia and have to frequently undergo painful procedures have been less studied. The researchers' experience of working with thalassemic children led to designing this study based on personal experiences and existing literature. This intervention requires minimum effort and time and is a convenient nursing intervention that could be used easily in clinical settings. The purpose of this study was to determine the effectiveness of Distraction during venipuncture in children suffering from thalassemia who referred to the Thalassemia Center in the city of Kerman, Southeast Iran.

Materials and methods

This was a clinical trial on 40 children from 6 to 12 years old, who had major thalassemia and referred to the Center for Thalassemia in the city of Kerman located in Southeast Iran, in 2010, who met the entry criteria. The sampling was based on the convenient method and participants were randomly divided into two groups (experiment and control).

Table 1: Comparing the mean of pain severity in study subjects according to behavioral and numerical pain scalesin two groups of breathing exercise and control.

Group	Statistical test	Breathing exercise	Control	Result
Numerical scale	Mann Whitney U	1.42 ± 1.85	3.13 ± 5.60	P = 0.000
Behavioral scale	Mann Whitney U	0.96 ± 0.75	2.80 ± 3.80	P = 0.000

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Entry criteria included being of 6 to 12 years old, having medical file in the Thalassemia Center and be willing to participate in the study. Those children who had physical problems (verbal, mental, visual and hearing problems) , psychological problems, or were using pain relief or anxiety medicine were excluded from the study.

Written consent from parents and verbal consent from children were obtained and then the patients were divided randomly into two groups. In one group injection was done in the usual way of the ward (without any attempt for pain relief) and in the other group, regular breathing exercise was practiced.

In the breathing exercise group, children were taught how to do regular breathing exercise and were asked to do it one minute before and during catheter insertion until fixation of angiocath (breathing method of Hey-hu: in this method first child takes a deep breath, exhale while whispering Hey, then inhale deeply again and exhale whispering Hu).

Data were collected using a demographic questionnaire, a scale for pediatric pain behavioral symptoms and numeric pain rating scale. Demographic data questionnaire was completed by interviewing the child or one of the parents. In the next stage, the behavioral pain scale during the procedure, in children of all two groups, were observed and recorded. Behavioral pain scale was used to determine the severity of pain of catheter insertion through children's reactions during injection.

The behavioral pain scale has been developed in an attempt to provide a simple consistent method of pain assessment in non-verbal or preverbal children. This tool incorporates 5 categories of behavior that have been used in other behavioral scales. The acronym FLACC (Face, Legs, Activity, Cry and Consolability) facilitates recall of the categories, each of which is scored from 0-2 with total scores ranging 0-10 similar to other clinical assessment tools. Inter-rater reliability of the FLACC among 2 observers was established in 30 children in the PACU (r=0.94). The reliability and validity of this tool has been established in diverse settings and in different patient populations [19, 20, 21].

After injection, children's pain was assessed by numerical pain scale. The numerical pain scale, also called by some as numeric rating scale (NRS) is a scale that asks the patient to grade pain from 0 (no pain) to 10 (worst pain)[22]. Numerical pain scale have been shown to have a high degree of inter-rater reliability, validity and versatility[23]. The nurse responsible for cathetering, size, type and manufacturer of catheter, side of injection and environmental conditions were the same in all cases. Data were analyzed using descriptive (frequency, mean and standard deviation) and iinferential statistics (Mann Whitney U and Spearman correlation).

Results

The results of the present study showed that 56.7% of subjects were female and 43.3% were male. The mean age of breathing exercise group was 10.25 ± 1.33 and in the control group it was 9.90 ± 2.38. There was no significant difference seen between these two groups regarding various variables such as age and gender.

Comparing the mean score of numerical pain scale between the two groups of breathing exercise and control by Mann Whitney U test showed a significant difference (p=0.0001). Also, comparing the mean score of behavioral pain scale between the two groups of breathing exercise and control by Mann Whitney U test showed a significant difference (p=0.0001) (Table 1).

There was a direct and significant correlation between the numerical pain scale and behavioral one using Spearman correlation (rho=0.674, P<0.001). There was a reverse and significant correlation between the increase of age and numerical pain scale score using Spearman correlation test, so that with the increase of age, the reported score of pain was lower (rho=-0.278, P < 0.05). There was also a reverse and significant correlation between the increase of age and behavioral pain scale score using Spearman correlation test (rho = -0.359, P < 0.01).

While the mean score of pain based on numerical pain scale in girls (3.02 ± 2.65) was a little higher than boys (3 ± 3.17), Mann Whitney U test showed no significant difference between the two groups (p = 0.678). Also, the pain score based on behavioral pain scale in girls (2.30 ± 2.66) was higher than boys (1.58 ± 1.78), butthe Mann Whitney U test again showed no significant difference (p = 0.324).

Discussion

The results of the present study show that

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the breathing exercise is effective in decreasing children's pain. Some former studies investigating pain control for IV insertion, DPT vaccination and dressing changes in burned children have reported that distraction had no effect on reducing pain[8]. But the use of animation distraction could reduce the response of preschool children during venipuncture [24]. Also, one study suggested that a passive strategy (such as watching TV) might be more effective than an active one (distraction with an interactive toy) for decreasing the pain of venipuncture because the child distress interfered with their ability to interact with the distractor [11]. The use of audiovisual distraction techniques have been demonstrated to be effective in reducing self-reported pain, improving children's cooperation and increasing success rates in venipuncture procedure as effectively as routine psychological interventions. These differences in results may be due to different methods of distraction and painful procedure [25, 26].

Esmaeili et al. (2008) and Valizadeh et al. (2004) compared two methods of breathing exercise and listening to music on pain of catheterization at the time of blood transfusion and found that although both method reduced children's pain significantly, the effect of music was more than breathing exercise [27,28]. It is important to know if simple breathing exercises are effective at significantly reducing injection pain and distress during venipuncture, because these exercises can be easily and quickly taught to children with minimal instruction. They also are inexpensive and easy to make available in the clinic or office settings.

Another finding of this study was no significant correlation between gender and self-reported pain and behavioral pain scale results. The results of a study by Arts et al. also found no significant effect for gender on the severity of pain and behavioral reactions, which is in agreement with the current study 29. Tootoonchi also found no significant relationships between severity of pain and gender[30]. Moreover, in the present study, there was a significant reverse relationship between age and pain score, so that by increasing age, the score of reported pain decreased. Arden found that younger children, regardless of intervention, reported significantly more pain than older children[31]. The results of other studies also show reverse relationships between pain and age. For example in a study by Pourmovahhed et al. (2008), the mean score of pain severity in 10 to 12 years old children was lower than 6 to 9 years old children. [32].

Conclusion

Distraction was demonstrated to be effective in reducing pain among children undergoing venipuncture. This intervention requires minimum effort and time and is a convenient nursing intervention that might be used in clinical settings.

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