Original Research Article

Effect of provider communication on perception of pain during intravenous cannulation: A double blinded randomized controlled trail

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Abstract

Background: Anaesthesiologists utilize communication skills in their day to day practice in order to reduce the pain perception of patients during invasive procedures like intravenous cannulation. Our study aimed to know the effect of three different types of communication provided by anaesthesiologists on perception of pain (primary outcome) and behavioural / visual discomfort (secondary outcome) during intravenous cannulation. Our study intended to study effect of communication on perception of pain during any invasive procedures. **Methods:** A double blind, randomized prospective clinical study was conducted on 300 patients who were posted electively for surgery. They were randomly allocated into three groups they were ST, NP and NU group. Each group received its respective communication in patient's own language. Our primary and secondary outcome measures were measured with Visual Analogue Scale (VAS) score and Modified Behavioural Pain Rating Scale (MBPRS) score respectively. **Results:** VAS scores (p=0.549) were not normally distributed, most of the patients perceived as mild to moderate pain and none of them had severe pain. MBPRS scores were obtained for both local anaesthetic injection and intravenous cannulation separately which showed p value of 0.826 and 0.827 respectively. **Conclusions:** The intensity of pain perception and behavioural display of pain during intravenous cannulation is similar for patients irrespective of the type of communication.
Key Words: Communication, Perception, Cannulation, Anaesthesiologist.

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INTRODUCTION

Communication skills are an important and essential part of anaesthesia practice.[1]Communication is an important skill which every anaesthesiologist has to acquire in his/her practice. More problems and difficulties arise from poor communication than from anything else in all medical and nursing practice.[2]Anaesthesiologists utilize communication skills in their day to day practice, in order to reduce the pain perception of patients during any invasive procedures like intravenous cannulation (i. v.) which is the most commonly done procedure. Perception is an active process of becoming aware and understanding ones environment that is unique to the individual and it is strongly influenced by communication. Perception and behaviour are frequently the result of subconscious responses to subtle nonverbal and other signals. In order to learn these communication skills and utilize them effectively, it is helpful to understand language structures that can elicit non-volitional subconscious patient responses that might be therapeutic such as anxiolysis.[3]Dirk Varelmann and l found that using gentler, more reassuring words improves the subjective experience during invasive procedures.[4]Pain perception can be reduced by different route of topical anaesthetics. Subcutaneous injections are used for immunizations, administration of drugs such as insulin and heparin and for local anaesthesia.[5] Topical local anaesthetic preparations like EMLA or Ametop gel help in reducing

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pain of intravenous cannulation in both children and adults.[6,7] But conversely it may not give complete anaesthesia and requires time for its action.[8,9]Another effective alternative to this topical LA is to inject local anaesthetic intradermally or subcutaneously at the site of proposed cannulation.[10]Cannulatingwith 22 gauge IV cannula is associated with some degree of discomfort or pain and it has been demonstrated that injecting local anaesthetic causes less pain than cannulation itself.[11] Anticipation of pain may increase a patient's sensitivity to it. Conversely, assurances of 'no pain' may cause the patient to expect more pain.[1] We planned to study how a patient's perception of pain may be modified by the communication immediately preceding cannulation and the three different types of communications used in our study were positive suggestion (pain/sting), negative suggestion (no pain) and neutral (no reference to pain). Our study aimed to know the effect of three different types of communication provided by anaesthesiologists on perception of pain(primary outcome) and behavioural /visual discomfort(secondary outcome) during intravenous cannulation.

MATERIALA AND MEATHODS

The present study was conducted in Anaesthesiology Department, Kasturba Hospital, Manipal after obtaining Institutional Ethical Committee permission. After written and informed patient consent, we recruited 300 patients who were electively posted for surgery where placement of i.v. cannulation was necessary, by randomly allocating patients into these groups with a computer generated randomization table. Patients included in the study were aged > 18 years, alert conscious and cooperative and who could speak English/ kannada. We excluded patients with anticipated difficult i. v. cannulation (burns/trauma/ post chemo therapy), patient's refusal to participate in the study, critically ill patients, patent i. v. cannula in situ, mentally challenged patients and patients with h/o allergy to local anaesthetic. Patients who were included in the study were informed about the need for the study and how different ways of providing information could affect the experience during insertion of cannula to start a drip. We had two observers, observer1 who was blinded to the study took consent and assessed visual analogue scale (VAS) score 2 minutes after cannulation. Observer2 who performed the procedure had randomization sequence and assessed Modified Behavioural Pain Rating Scale (MBPRS) score while inserting cannula. The three groups and there communications were, Group ST: Received the communication that "the intravenous cannula will be placed after giving local anaesthesia and the procedure may sting a bit" Group NP: Received the communication that "the intravenous cannula will be placed after local anaesthesia and it will not be painful" Group NU: Received the communication that "the intravenous cannula will be placed after local anaesthesia and the skin of your hand will feel numb" Sample size calculation was done based on the pilot study results, which included five patients in each three groups and found to have a VAS score difference of 1. Based on this data, it was found that 100 patients in each group were required to have a power of 80% and with α value of 0.05 at 95% confidence interval for a VAS score difference of 0.75. All patients were pre medicated with alprazolam 0.25mg if <=50kg, 0.5mg if> 50kg. They were informed during pre-operative assessment about the need for placement of i.v. cannula prior to surgery. Written informed consent was obtained from all the participating patients. Intravenous cannula was sited only in veins of dorsum of the upper limb. In all the patients studied, 18 gauge i.v. cannula was used. A maximum of two attempts at cannulation were permitted. If more than two attempts, patient were excluded from the study. In our study three patients required more than two attempts and were excluded from the study. Observer 2 opened the sealed envelope in the procedure room. The vein on the dorsum of hand was identified by applying tourniquet. The allocated statement to that particular patient was delivered before giving local injection with 0.25ml of 2% lignocaine. I.V cannula was inserted after 30 seconds under sterile technique. Intravenous cannula was firmly secured and fixed and accordingly crystalloids were started. Patients were asked by observer1 to mark the pain they felt during the cannulation procedure, on a Visual Analogue Scale (VAS). VAS score was taken for the highest pain felt, whether it was perceived for subcutaneous local anaesthetic injection or to i.v. cannulation. Assessment of pain using Visual Analogue Scale was done and was graded as follows: No pain- 0, Mild pain – >0 to <4, Moderate pain- 4 to <7, Severe pain- 7 to 10. MBPRS score was additionally used for secondary outcome measures which was assessed by observer2.The severity of the pain was be based on the highest score obtained in any of the visual parameters. MBPRS score was taken separately for both subcutaneous local anaesthetic injection and i.v. cannulation and was graded as follows: score 0- no pain, score -1 –mild to moderate pain score 2- severe pain.

RESULTS

Of the 297 patients, intravenous cannulation was performed successfully in the first attempt in 285 patients and 12 patients required a second attempt. The mean age of the patients in ST group is 44.49±14.13, NP group is 44.57±15.47 and in NU group is 41.78±14.28. In the study 62 male and 38 female patients were in ST group, 56 male and 42 female patients were in NT group, 63

male and 36 female patients were in NU group. VAS scores in ST group, 4 (4%) had no pain, 85 (85%) had mild pain, 10 (10%) had moderate pain and 1(1%) had severe pain. In NP group 5 (5%) had no pain, 77 (78.57%) had mild pain, 15 (15.30%) had moderate pain and 1(1%) had severe pain. In NU group 7 (7%) had no pain, 72 (72.72%) had mild pain, 19 (18.8%) had moderate pain and 1(1%) had severe pain. (Table 1) We used Chi-square test for VAS scores (p= 0.582) which showed results were comparable MBPRS scores for local anaesthesia injection, ST group found 51 (51%) patients had no pain, 38 (38%) had mild to moderate pain and 11 (11%) had severe pain. In NP group 44 (44.89%) had no pain, 40 (40.81%) had mild to moderate pain and 14 (14.28%) had severe pain. In NU group 45 (45.45%) had no pain, 40 (40.40%) had mild to moderate pain and 14 (14.14%) had severe pain. (Table 2) Results of MBPRS scores (p value=0.891) were comparable with Chi-square test. MBPRS scores for cannulation were, in ST group 64(64%) had no pain, 34 (34%) had mild-moderate pain and2 (2%) had severe pain. In NP group 58 (59.18%) had no pain, 35 (35.71%) had mild-moderate pain and 5 (5.1%) had severe pain. And in NU group 64 (64.64%) had no pain, 29 (29.29%) had mild-moderate pain and 6 (6.06%) had severe pain. (Table 3) Using Chi-square test results were comparable (p=0.559). During local intravenous injection one patient from NP group had jerking away of the upper limb and 4 patients who had loud cry, 3 were from NP group and one was from NU group. During intravenous cannulation 2 patients had loud cry, one from NP group and another from NU group. One who had jerking away of the upper limb during cannulation was from NU group. All together if we take, in NP group 4 patients had loud cry and one patient had jerking away of upper limb. In NU group 2 patients had loud cry and one patient had jerking away of the upper limb.

Table 1: VAS Score and Communication

	Sting Group	Nil Pain Group	Numb Group	Total	P value
No pain(0)	4 (4%)	5 (5%)	7 (7%)	16 (5.38%)	
Mild pain (>0-<4)	85 (85%)	77 (78.57%)	72 (72.72%)	234 (78.78%)	
Moderate pain (4 - <7)	10 (10%)	15 (15.30%)	19 (18.8%)	44 (14.81%)	0.582
Severe pain (7-10)	1 (1%)	1 (0.98%)	1 (0.99%)	3 (1.01%)	
Total	**100 (100%)**	**98 (100%)**	**99 (100%)**	**297 (100%)**	

VAS scores in ST group, 4 (4%) had no pain, 85 (85%) had mild pain, 10 (10%) had moderate pain and 1(1%) had severe pain. In NP group 5 (5%) had no pain, 77 (78.57%) had mild pain, 15 (15.30%) had moderate pain and 1(1%) had severe pain. In NU group 7 (7%) had no pain, 72 (72.72%) had mild pain, 19 (18.8%) had moderate pain and 1(1%) had severe pain. We used Chi-square test for VAS scores (p= 0.582) which showed results were comparable.

Table 2: Comparison of Modified Behavioural Pain Rating Scale grading during Local Anaesthetic injection

	Sting Group	Nil Pain Group	Numb Group	Total	p value
No pain (0)	51 (51%)	44 (44.89%)	45 (45.45%)	140 (47.13%)	
Mild – moderate pain (1)	38 (38%)	40 (40.81%)	40 (40.40%)	118 (39.73%)	0.891
Severe pain (2)	11 (11%)	14 (14.28%)	14 (14.14%)	39 (13.13%)	
Total	**100 (100%)**	**98 (100%)**	**99 (100%)**	**297 (100%)**	

MBPRS scores for local anaesthesia injection, ST group found 51 (51%) patients had no pain, 38 (38%) had mild to moderate pain and 11 (11%) had severe pain. In NP group 44 (44.89%) had no pain, 40 (40.81%) had mild to moderate pain and 14 (14.28%) had severe pain. In NU group 45 (45.45%) had no pain, 40 (40.40%) had mild to moderate pain and 14 (14.14%) had severe pain. Results of MBPRS scores (p value=0.891) were comparable with Chi-square test.

Table 3: Modified Behavioural Pain Rating Scale (MBPRS) grading during intravenous cannulation

	Sting Group	Nil Pain Group	Numb Group	Total	p value
No pain (0)	64 64%	58 59.18%	64 64.64%	186 62.62%	
Mild-Moderate pain (1)	34 34%	35 35.71%	29 29.29%	98 33%	
Severe pain (2)	2 2%	5 5.1%	6 6.06%	13 4.37%	0.559
Total	**100 100%**	**98 100%**	**99 100%**	**297 100%**	

MBPRS scores for cannulation were, in ST group 64(64%) had no pain, 34 (34%) had mild-moderate pain and2 (2%) had severe pain. In NP group 58 (59.18%) had no pain, 35 (35.71%) had mild-moderate pain and 5 (5.1%) had severe pain. And in NU group 64 (64.64%) had no pain, 29 (29.29%) had mild-moderate pain and 6 (6.06%) had severe pain. Using Chi-square test results were comparable (p=0.559).

DISCUSSION

Anaesthesiologist's words lead to subconscious changes in the patient's mind. Patients find themselves in the state of being in 'two minds' about something; being 'besides oneself', out of body experiences; day dreaming kind of altered state of conscious awareness when they present to the operation theatre for anaesthesia and surgery.[3]Whatever techniques of various forms of communication used by the anaesthesiologists have not been taught to them formally, but have been learned instead as a part of the informal or 'tacit' knowledge of anaesthetic practice. This hypnotic state increases the likelihood of patients responding subconsciously to communications which effectively function as suggestions that can lead to changes in patient perception and behavior.[12,13] In our study, we chose intravenous cannulation procedure as the pain model as it is the most commonly performed procedure in routine anaesthetic practice. We chose VAS because it is the most commonly used pain scale and gives a very simple assessment of pain. More so it was easily understood by the patients and could communicate to us regarding the severity of pain with the help of this pain scale. The modified behavioural pain rating scale was the modification of behavioural pain rating scale used in children who are unable to communicate and quantify the pain perceived and we wanted to see behavioural response in adults. In our institute we prefer using local infiltration for any cannulation equal or above 18 gauge cannula. In a study conducted by T. Harris and l studied the use of local anaesthetic and factors affecting pain perception for cannulation in the emergency department, showed that use of local anaesthetics before cannulation could reduce the pain felt for cannulation and this study also shows that experience of cannulator, patient characteristics and cannula size does not affect the pain scores.[14] We conducted this study to find out whether communication skills really affect the pain perception of patients who are undergoing cannulation. We did not make out any change in the perception of patients in three different kinds of communication used in the study. Another observation was, majority of the patients felt giving local infiltration using 26 gauge needle was painful than actual cannulation itself. As there was no significant difference in perception of pain in three groups, it requires further study to know any differences present between the different age groups or in the gender groups. Our study had some limitations. Our study was based on psychological aspects, anxiety status and emotional aspects of the patient. All these factors were subjective to the patient. The second limitation of the study was that the person who performed the intravenous cannulation procedure was not the same to all patients but very well experienced in i.v. cannulation. Even though the sentence communicated by all the persons who performed the procedure was the same, the way in which it was communicated would have been different which again might have an impact on the patient's perception of pain.[15]Our sample size was inadequate to study the differences in pain perception between different age groups and between male and female gender. Another limitation was that we used local anaesthetic injection before cannulation, so most of the patients felt local injection was painful than cannulation itself. But using local anaesthetic injection was necessary as canuula we used was 18 gauge and it was wide bore cannula, so we thought it is ethical to use local anaesthetic and also our study was on the effect of communication on pain perception. Finally we could get the information by doing the study is that the intensity of pain perceived during the procedure of cannulation is similar for patients irrespective of the type of communication provided by the operator and behavioural display of pain for both local anaesthetic injection and intravenous cannulation is not influenced by the type of communication.

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