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Research Article

Anxiety Comparison among Patients Who Received Acupressure: Syringe versus Butterfly Needle

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Abstract

Background: Peripheral blood sample collection is an invasive practice and not at all free of psychological repercussions. This study aimed to analyze the correlation between anxiety and pain during the peripheral vessel blood sampling procedure; check whether the difficulty in sampling and the stasis of tourniquet induce an increase in anxiety.

Method: Patients in September-October 2017, at the Pennetti Analysis Laboratory in Barletta (Puglia, Italy). Inclusion criteria were: absence of haematological diseases or coagulopathies; absence of pathologies that can alter the results. Recording data by occult observation and transcription of pre-post- venipuncture anxiety using the MADS scale.

Results: 314 subjects were involved in this study (188 females, 126 males), mean age was 46 ± 24 years. Devices used were: syringes with 22 Gauge needle (224 patients, 71%) and butterfly needle 23 Gauge (90 patients, 29%). Mean stasis of tourniquet was for syringe 42 ± 4 seconds and 76 ± 5 seconds for butterfly needle. Anxiety was performed with the MADS scale in the pre and post sampling moment: syringe device: 22.5 ± 3.74 and then 15.9 ± 4.85%; butterfly needle: 12.7 ± 4.24 and then 24.2 ± 3.75. Pain was assessed with the VAS scale: 1.3 ± 0.8 for syringe and 2 ± 1.2 for butterfly needle.

Conclusion: Blood sampling with syringe induces anxiety decreases immediately after the procedure, while the butterfly needle sampling has less anxiogenic impact on the patient, but its use on patients with difficulty in finding a venous access causes correlation with negative sensations, despite the device being less physical and visual impact.

INTRODUCTION

Venipuncture has been reported to be the most universal painful circumstance for a hospitalized patient. Numerous patients are diagnosed with acute behavioral distress while routine venipuncture tests [1]. Pain is one of the most common reasons of human distress, noticing indication for physical injury which is typically undertreated. Pain is defined as the fifth vital sign and its deficient management is correlated to several immediate and long term negative outcomes. Pain is a highly important problem in children and adults. It is a predominantly subjective emotional distress that leads to impairment in the quality of life. It is reported that anxiety in children can increase their subjective perception of pain, but it can reduced if their attention is focused on a distractive activity [2]. Venipuncture is one of the most worry, distressing and painful invasive procedures in patients. Owing to a natural fear of needles, almost all clients feel anxiety before and during venipuncture, and also a pain. Traumatic experiences connected with venipuncture can produce extreme anxiety. Treatment and prevention of pain and anxiety in patient are predominant for their immediate well-being and future development, including harmful effects on the immune and neurological system, behavior and mental health. Painful experiences in early childhood, their frequency and recall can maintain the negative effects. Negative reactions, including phobia correlated to previous procedures, may exacerbate the situation and reduce the likelihood to successfully carry out venipuncture [3].

When patients express needle phobia or a “fear of needles”, it may help to propose strategies to induce the patient get through the procedure safely. Sometimes, the anticipation of the needlestick may cause anxiety, and sometimes seeing the blood filling the tubes makes a patient uneasy.

It may be useful to involve the patient in conversation during the venipuncture to keep the patient’s mind off the procedure. In some circumstances, the phlebotomist may seek assistance from a qualified associate to distract the patient with conversation or provide comfort and support by offering to hold the patient’s

hand [4].

Although anxiety and pain are variables related to sampling, they represent experience of short duration, and in this context it requires that the procedures carried out without proper control of them in order to cause negative emotions and reduce therapeutic compliance.

The choice on medical devices used for venous blood collection related to numerous factors, such as: safety standards (related to patient and nurse), evaluation of technical and economic factors and pain factor in particular situation.

Scientific literature recommended using devices that included the integration of disposable needles, support systems (holders, adapters or "shirts") and primary vacuum tubes. Syringes represented a possible alternative in emergency contexts or in situation where particular anatomical and/or physical situations make it impossible or inadvisable using butterfly dispositive.

However, in no case the volume of blood extracted with every need dispositive should exceed 20ml. This recommendation was based on the concept that blood transferred from the syringe to the test tube introduced a further preanalytical variable, which in some tests could be decisive for the accuracy of the exams [5].

Despite the common blood collection procedure was based on the use of holders and traditional needles, in Italy the use of butterfly needle devices was very widespread.

Scientific literature showed that blood collection devices were used appropriately there were no significant influences on laboratory results [6,7].

The major concerns about the routine use of these devices regarded economic considerations, since their costs were higher than traditional needles. Generally, international recommendations reserved the use of butterfly devices for only specific situations, in which veins were difficult to access with traditional devices.

Moreover in scientific literature specific indication related the needle gauge to use during a blood collection did not exist. Data were agreed to indicate that small gauge needle, as less 23 gauge, caused haemolysis and modest variations in all ions, in fibrinolytics indices and in platelet count.

Generally, scientific recommendations suggested to prefer 20 or 21 gauge needles and to use small needle gauge with small and fragile veins.

Moreover, it was highlighted that butterfly needles were not used to procure less pain in the act of sampling, but it has been observed that most patients mistakenly believed that using butterfly needles reduced painful sensation, lowering anxiety level before and during the venipuncture procedure.

Considering the scientific literature this research project aimed to study the anxiety level among patients undergoing a peripheral blood collection procedure through the use of butterfly needle or syringe needle.

Specific objectives of the research project were:

- analyze correlation existed between anxiety and pain level during the blood collection procedure from a peripheral vessel, by paying attention to the site identification and the needle gauge used;
- observe if the difficulty in sampling and the stasis of the tourniquet induced anxiety increase;
- examine the platelet aggregation and hemolysis indexes in order to assess the correct execution of blood sampling.

MATERIALS AND METHODS

Patients in September-October 2017 were recruited at the Pennetti Analysis Laboratory in Barletta (Puglia, Italy). This laboratory was managed by private subjects and an explicit consent was obtained for the data collection in order to perform this study to present at the end of the nursing degree course. Moreover, all participants agreed voluntary to participate in this study and they gave their consent.

Inclusion criteria adopted for participants recruitment were:

- subjects who arrived in room n. 6 of the Pennetti laboratory during the referred period;
- subjects aged from 10 to 90 years old, both males and females (collecting all consents for enrollment in this study);
- participants who carried out blood control through a package proposed by the laboratory named as "Wellness Man" or "Wellness Women", or "Wellness Baby";
- subjects who declared that they were not affected by hematologic diseases and/or coagulopathies;
- subjects who declared that they did not have other diseases that can interfere with the laboratory results.

In order to obtain objective and systematic data we created a diary registration form.

Data collected included: demographic characteristics of enrolled subjects, characteristics of blood collection procedure (site, gauge needle, tourniquet stasis, procedure difficulty) and blood sampling characteristics (blood amount sampling, hemolysis index, platelets index).

The researcher used concealment with intervention, through direct observation, assessing anxiety values thanks to the Modified Dental Anxiety Scale (MDAS) scale and pain values thanks to the Visual Analogue Scale (VAS) scale [8-10].

The MDAS scale is a brief, self-complete questionnaire consisting of five questions and summed together to produce a total score ranging from 5 to 25 to assess anxiety levels in different situations.

The VAS scale consists of a straight line with the endpoints defining extreme limits such as "no pain at all" and "pain as bad as it could be". The patient is asked to mark his pain level on the line between the two endpoints. The distance between "no pain at all" and the mark then defines the subject's pain.

All this was considered in order to demonstrate if all these variables had consequences on laboratory results as platelet aggregation and the presence of free hemoglobin.

Moreover, the site chosen for venipuncture was evaluated,

firstly including median forearm, followed to basilica, cephalic and hand veins.

RESULTS

A total of 680 patients arrived in the Pennetti laboratory in the period considered. Of these 314 (46.20%) well respected the inclusion criteria above mentioned. 126 (40%) participants were male and 188 (60%) participants were female. They were 46 ± 24 years old.

In 224 (71%) subjects were used 22 Gauge needles with syringe device. Butterfly devices with 23 Gauge needle were reserved in patients with evident difficulty in venous site and in the situation where patients explicit required butterfly device use (n=90, 29%).

Blood quantity mean collected was 7.4ml with syringe devices and 8.3ml with butterfly devices.

Anxiety levels among participants before and after blood sampling procedure was assessed thanks to the MADS scale, by considering range values from 0 to 10.

40.1% of participants belonged to the "Syringe" group appeared anxious before the venipuncuture procedure (MDAS value as: 22.5 ± 3.74). These values decreased after venipuncture (MDAS value as: 15.9 ± 4.85).

While, in the "Butterfly" group, 15.9% of participants appeared anxious before blood collection (MDAS value as: 12.7 ± 4.24) and after blood sampling procedure 24.2% of them registered a higher pain level (MDAS value as: 24.2 ± 3.75).

Therefore, it was showed that blood sampling with syringe induced more anxiety than the butterfly needle, but it decreased immediately after the procedure. While, in the butterfly group anxiety levels after the venipuncuture procedure raised. It may be correlated with the grade of difficulty to perform the venipuncuture procedure.

Moreover, pain was assessed during the venipuncuture procedure. Participants registered more pain with the butterfly device than the syringe device. This condition may explain the increasing anxiety levels with butterfly device.

Furthermore, it was assessed mean time of the tourniquet stasis between syringe (42 seconds), and butterfly (76 seconds) needle techniques.

Additionally, it was investigated pain sensations among participants during blood sampling which caused anxiety. Pain sensation was assessed thanks to the VAS scale. VAS values registered among participants between syringe and butterfly blood collection devices showed that participants using syringe device felt 1.3 ± 0.8 VAS pain values, while subjects using butterfly devices registered 2 ± 1.2 VAS pain value.

Among them the presence of hematomas was registered. 20 subjects belonged to the "Syringe" group had a hematoma post procedure, while 33 participants had an hematoma in the "Butterfly" group.

Table 1 illustrated all data registered during blood collection by considering different blood sampling devices.

Table 1: Data collected in the syringe and butterfly groups.

Variable	Syringe group (n=224)	Butterfly group (n=90)
Blood quantity collected (ml)	7.4	8.3
Anxiety levels (MADS scale) before venipuncuture	22.5 ± 3.74*	12.7 ± 4.24*
Anxiety levels (MADS scale) after venipuncuture	15.9 ± 4.85*	24.2 ± 3.75*
Time of presence of tourquinet (seconds)	42 ± 4*	76 ± 5*
Pain sensation during blood sampling (VAS scale)	1.3 ± 0.8*	2 ±1.2*
Presence of hematomas after the blood collection procedure (number of subjects)	20 (8.6%)	33 (37.5%)

*Data were reported as means and standard deviations.

DISCUSSION

Our results suggested different anxiety levels which depended from different blood sampling devices. It was very interestingly that anxiety levels after blood sampling procedure decreased in the syringe group, while in the butterfly group raised. Both pain sensations during blood collection procedure and time of presence of tourquinet augmented in the Butterfly group than in the Syringe group. These conditions may explain MDAS values into two groups, which reported higher initial anxiety levels. However, it was observed that anxiety reduced more in the Syringe sample than in the Butterfly group.

Finally the presence of hematomas after the procedure was higher in the butterfly group than in the other one.

This research also highlighted that patients who underwent blood collection procedure were often misinformed related to the type of device used and pain sensation. So it lead an initial anxiety state amplifying painful perception in these patients.

Therefore, in daily clinical practice, it is necessary to increasingly promote the adoption of the effective and validated techniques known as systemic desensitization.

As regards pain, our results showed that smaller gauge needle was not correlated with anxiety reduction.

Although pain has deeply investigated, it remained a cultural concept that sometimes its reduction and management were not considered as a priority. Anxiety and worry that anticipated the venipuncture procedure might represent a stressful reason for patients.

Scientific literature supported that venipuncture pain in patients results from a variety of co-factors which increase the intensity of the nociceptive stimulus [11-13]. For them, venipuncture is one of the most fearful and painful aspects, which make them, feel the most anxious.

Pain is a multifactorial experience, which is influenced by numerous factors. In order to avoid as many confounding variables as possible, we intentionally decided not to include in our study subjects affected by hematologic diseases and/or coagulopathies and patients who declared that have other diseases that can interfere with the laboratory results. In this

way we limited the evaluation of pain experience differences only to a single type of acute, invasive pain. This is because in subjects, having a chronic disease had the potential to increase the perception of pain intensity and acute and chronic pain had different physiopathologic patterns and effects on perceived discomfort. As a consequence, any possible inference from our results can only apply to venipuncture pain and to subjects enrolled without a chronic condition [14-16].

Although, our study has some limitations. Firstly, the number of participants is limited. Secondly, the subjects were not randomly chosen, which would have made our results more robust.

Therefore, it is essential nurse professionalism in understanding clients' needs, as mentioned in the Italian Nursing Ethical Code: " The nurse listens, informs, involves patient and assesses care needs with him, also to clarify guaranteed assistance level and facilitate him in expressing own choices.

Scientific literature showed that all venipuncture procedures produced only transitory mild discomfort experience painful sensations in several ways, which negatively cause care removal. In this context several methods of distraction with the purpose to prevent pain and anxiety were studied and assessed" [17].

The informative process or the preparation for a stressful event can be for a nurse a valid contribution in order to improve patient's outcome. Making patient actively involved in managing his own health can be considered an investment for the future and a great result for the nursing profession [18].

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CONFLICT OF INTEREST

All authors have participated in: conception and design, analysis and interpretation of the data; drafting the article or revising it critically for important intellectual content; and approval of the final version.

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