Proposed Protocol Illustrated for Hipodermoclisis

Abstract

Introduction: Hypodermoclisis is a subcutaneous puncture technique that allows the infusion of fluids and drugs, an ancient technique that has been replaced by new methods, currently being discussed with a view to recovering its practice, and to explore its peculiarities, allowing its implementation in the face of its benefits.

Objective: To elaborate an illustrated puncture protocol in a public hospital in the interior of São Paulo. Method: This is a qualitative, exploratory and descriptive research, in order to obtain the images of the technique and its respective puncture sites, in order to develop an illustrated protocol. It was performed in the palliative care sector, with randomly selected patients, not considering their respective diagnoses and/or time of hospitalization.

Result: Development of the illustrated protocol describing the materials used, and the technique for puncturing. Among the possible illustrated places are the regions: interscapular; subclavicular; deltoid; abdominal and anterolateral aspects of the thigh.

Conclusion: It was possible to develop a facilitating and enlightening tool in the accomplishment of the hypodermoclisis technique, in a safe and objective way, providing a global view of this nursing assistance, being possible to align its execution form, visually and didactic

Keywords: Hypodermoclisis; Subcutaneous; Medication; Palliative; Protocol; Nursing

Introduction

Hipodermoclisis is a method of fluid replacement and administration of drugs by subcutaneous (SC), its use is more frequent in palliative patients, children and elderly, it is still an indicated alternative for patients in terminal phase [1]. The subcutaneous tissue is endowed with blood capillaries becoming a conduit conducive to the administration of fluids and such drugs, once they are absorbed and transported the microcirculation. The vascularization of subcutaneous tissue accounts for approximately 6% of cardiac output, allowing a rate of absorption very similar to that of intramuscular administration of drugs reaching lower serum concentrations, but with prolonged action time similar to that of intravenous access patients with collapsed veins and fragile vascularization of subcutaneous tissue is endowed for approximately 6% of cardiac output, allowing a rate of absorption very similar to that of intravenous access patients with collapsed veins and fragile vascularization. The correct use of hypodermoclisis is considered safe and recommended due to its effectiveness and ease of application, besides patient comfort, durability of access and low cost in relation to intravenous catheters, associated to reports of problems related to the misuse of the technique due to serious adverse effects, such as hypovolemic shock, administration of hypertonic solutes and glucose solutions, caused a decline in its use in the practice of care, many institutions have now rescued the use of this technique [4,5].

The practice of using the subcutaneous route for infusion of large volumes is known worldwide, this technique has been carried out since the eighteenth century, there are reports that in the nineteenth century was used during the cholera epidemic in Europe. In 1895 in the cholera epidemic in India, [3] but only in 1979 Russel described the use in cancer patients for analgesia, after publication the method began to be studied. In Brazil in the 1940s and 1950s the practice of hypodermoclisis began to be used in pediatric patients, later with the introduction of more modern intravenous catheters, associated to reports of problems related to the misuse of the technique due to serious adverse effects, such as hypovolemic shock, administration of hypertonic solutes and glucose solutions, caused a decline in its use in the practice of care, many institutions have now rescued the use of this technique [4,5].

The correct use of hypodermoclisis is considered safe and a technique of choice in dehydrated and nutritional deficient patients, due to its effectiveness and ease of application, besides patient comfort, durability of access and low cost in relation to intravenous access patients with collapsed veins and fragile ones that break easily. Being principally prescribed for fluid replacement, patients with oral impairment with vomiting and diarrhea may suffer a water imbalance leading to dehydration related to loss of fluid and electrolytes, and mild to moderate dehydration in patients with antibiotics, analgesics and anti-neoplastic agents [6].

Its great advantage is related to length of stay, which can be
maintained for more than 5 days, reducing pain, with few side
effects, easy handling and maintenance, as well as avoiding the
discomfort of venous punctures. This method can be used in
home and hospital care, has the benefit of preservation and
manipulation, low cost, can be interrupted and restarted at any
time, low infection rates, reduced risk of cardiac overload and
shorter hospitalization time, good acceptance by relatives and
does not require immobilization of the limb, providing more
autonomy to the patient [7].

Although the use of the technique in palliative patients is more
common, hypodermoclisis can be used in other settings, such as
in the treatment of cancer patients or in pediatric patients such
as neonates, adherence to subcutaneous drug therapy can be
implemented, since patients frequently present conditions that
prevent adequate maintenance of levels of hydration and nutrition
[8]. Currently the choice of technique is more widespread in
elderly patients, due to the compromised venous network caused
by the decrease of body fluid, which makes it difficult to locate the
vessel, the stiffening of vessels, and the fragility of the walls of the
vessels, resulting in a greater probability of rupture of the vessels
in the intravenous infusion. In cases where dehydration occurs and
it is necessary to keep the client in continuous infusion, venous
puncture should be considered as causing more discomfort,
from the technique of garnering until insertion of the catheter and
maintenance of the pathway, which makes the hypodermoclisis
the best route for the elderly patient, as well as patients in similar
conditions with fragility of blood vessels [9]. Most patients with
advanced tumors do not require large hydration fluids, since they
generally have a reduction in body weight, less activity, decrease
of free water clearance, therefore, hypodermoclisis therapy offers
a smaller volume of solution to maintain function and avoid side
effects [10].

A maximum volume of 1500 ml 3,2000 ml11 infusion is found
every 24 hours at each catheter insertion site in a continuous or
intermittent manner; where bolus administration may be up to
two ml and should be monitored and reported in in the case of
phlogistic signs at the insertion site of the catheter, or complaint
of discomfort, extravasation of the liquid, the absorption of
the drug occurs through the hydrostatic and osmotic force
thus arriving in the patient's bloodstream, the action of the
infused drug has peak plasma action in around 20 minutes,
is widely used in cases of prolonged use of analgesics [11].
The care of palliative patients has been discussed in an effort
to improve care and promote well being to the patient, considering
that many patients come from long and painful treatments, in this
work we intend to prove that through the rescue of the technique
it is possible to provide an improvement in relation even though
in a timely manner, large institutions have already adhered to
this practice, such as the National Cancer Institute (INCA), São
Paulo infectious disease hospital Emilio Ribas, institutions with
geriatric and palliative wings, as we mentioned among the risks
and benefits the technique offers many benefits in general [12,13].

Considering the plurality of criteria for the use of
hypodermoclisis, it is noticed that there is a lack of studies that
explore and expand the possibilities of using the technique in
neonates and pediatric as mentioned previously in the discovery of
the procedure, through the research we observed that the subject
is little approached in bibliographies and studies, considering that
the work of the nursing team is extremely broad in what refers to
the administration of medications is largely the competence of the
nursing team, therefore there is a need to broaden the discussion
about the technique, explore its peculiarities and publish findings
important for a better understanding of the hypodermoclisis
issue [14].

**Goal**

Elaborate protocol with delimitation and illustrated
description of sites and puncture techniques for hypodermoclisis

**Method**

A qualitative, exploratory and descriptive study was carried out
in a public hospital, a philanthropic institution located in the
interior of São Paulo, in the municipality of Jundiaí. The Hospital of
Charity Saint Vincent de Paul came through a Catholic movement,
which in 1897 held a conference with the intention of developing
works, to help the poor and practice charity according to the
need encountered by the group in serving the population his
objectives were expanded and redirected on December 20, 1902.
It is currently a reference hospital, which serves a region of
around 800 thousand people, from Jundiaí and region, with
around 20 thousand visits per month, with approximately eight
care programs developed in various clinical specialties.

In the palliative care sector of the hospital, there is a registry
of 188 patients that aggregates those with some progressive or
incurable disease, such as cancer, dementia, multiple sclerosis,
receiving guidelines and specialized care. The sector is composed
of a multidisciplinary team with the proposal to attend the patient
in its physical, psychological and social aspect.

A technical visit was made to the nurse responsible for the
sector and the methodology of the research, which would be
recorded, using as a tool a Kodak® Easy Share C1013 digital
camera with 10.3 mega pixels, which does not have an integrated
system with internet or any media, only memory card, handled by
the researchers, it did a schedule to start the search. Regarding
the procedure for data collection: puncture procedure was
followed for hypodermoclisis in patients of the sector, selecting
patients with indication for technique, where the puncture sites
were evidenced and recorded. Both were photographed with the
consent of the patient, about the care of not identifying the patient
and the nursing professional at the time of the records.

Sufficient patients were selected until the possible evidence of
all puncture sites. Thus, aiming at the comfort of the patient, the
dependency of the accepted ones after the explanations about the
research and attendance to the objective, the research was carried
out in October 2017, being necessary 3 periodic visits, once a
week, with permanence of 2 hours per day for recording puncture
sites. They were part of the collection of informed patients that
accepted to participate in the research, after all the orientation
and explanation of the same, clarifications of doubts and signing
of the Term of Free and Informed Consent (TCLE).
Three patients were chosen independently of the genus, at the suggestion of the nurse responsible for the palliative care sector, not having the diagnosis, hospitalization time, history or any other patient data as a criterion. The professional who performed the puncture was a nursing technique, under the supervision of the nurse who evaluated the puncture site. The work was approved by the Ethics Committee of the Campo Limpo Paulista School and registered under number 2,299,366.

Result

Figures
Discussion

The results found in the study showed that puncture for hypodermoclisis has been used as an alternative method in the treatment of palliative care, patients with nutritional and dehydrated deficits, due to their current state of health, it is impracticable to administer the medication orally, on many occasions the venous network becomes fragile, making venous access difficult or difficult. Hypodermoclisis is indicated because besides being a safe technique with few side effects, in relation to other infusion routes it is easy to perform, low cost, good acceptance by the family, effectiveness in the functionality and also promotes humanized care, through comfort and relief to patient [2,3,6].

Studies have shown that there are divergences with the technique, while some publications mention that it should follow infusion time criteria, such as 1 ml per minute totaling 60 ml/hour [4,15]. Other publications mention infusion of 80 to 100 ml/
hour [11], While the agency of the Regional Council of Nursing of São Paulo (Coren-SP) recommends the exchange in 72 hours, in relation to the time indicated for exchange of access caliber of catheter. Likewise, the body defines that a 23-25 gauge scalp should be used while the same recommendation is not found in other articles 4, 6. As to the positioning of the catheter, it is possible to find recommendations for performing a 180° rotation of the catheter after punch, causing the bevel to be facing down [7,13]. Such information is not mentioned in most publications. In view of the respective findings, it becomes evident the need to align the technique, it shows the importance of the construction of protocols to standardize the nursing care, it enables a safe and effective assistance in the exercise of the function [16].

Among the main difficulties related to the execution of the technique, during the research it was possible to observe that, although the technique was performed more than 5 years in the institution, it is not all the professionals in the sector that are qualified to carry it out, being delegated to those trained. It is noticed that there is difficulty and lack of knowledge of the professionals regarding the possibilities of puncture site, being more common the puncture in anterolateral region of the thigh, realizing only rodizio between the two limbs, even when there is indication of puncturing another site. In view of the possible difficulties, the illustrated protocol becomes an important tool for the routine of the sector, being possible to obtain a clear and objective perception in the realization of the technique, within the range of its possibilities.

Regarding nursing care, being extremely important for the outcome of the treatment during the infusion are: evaluation of the puncture site in the first 4 hours every 1 hour; integrity of the skin; phlogistic signs (pain, redness, heat and edema); signs of infection; fever and bruising [3]. Although the subcutaneous route is a safe technique, it is necessary to follow some general recommendations such as: to consider the volume allowed for the site and time of infusion. Fluid replacement should follow criteria for its concentration, with isotonic fluid being allowed glucose 0.5% serum and hypertonic fluid SF 0.9% [16]. The volume to be infused must follow the medical prescription, respecting the maximum limit according to the regions: subclavicular and deltoid 250 ml/24 hours; interscapular and abdominal 1000 ml/24 hours, anterolateral thigh 1500 ml/24 hours. It will be up to the professional to evaluate the caliber of the catheter according to the volume, and it is necessary to evaluate...
the nutritional status of the client [6]. It is recommended not to perform puncture in places with little adipose tissue; to consider how compatible medications the route and drug interaction, taking into consideration factors of combination of other substances and reaction that can bring to the patient [13,14,16].

See the tables below for medications and their compatibility.

**Table 1:** Compatibility of medicinal products, Jundiaí / SP.

<table>
<thead>
<tr>
<th>Medications</th>
<th>Cefepime</th>
<th>Ceftriaxone</th>
<th>Dipyrone</th>
<th>Furosemide</th>
<th>Haloperidol</th>
<th>Levomepromazine</th>
<th>Metoclopramide</th>
<th>Midazolam</th>
<th>Morfina</th>
<th>Octreotide</th>
<th>Ondansetron</th>
<th>Ranitidina</th>
<th>Tramadol</th>
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Source: Handbook of Hypodermoclisis16 adapted.

Next the relation of the exclusive site, with their respective diluents and time of infusion:

<table>
<thead>
<tr>
<th>Medicines</th>
<th>Dilute</th>
<th>Remark</th>
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<tbody>
<tr>
<td>Cetorolaco</td>
<td>SF 0,9%</td>
<td>Exclusive way</td>
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<tr>
<td>Dexametasona</td>
<td>SF 0,9% ou AD</td>
<td>Slow application, exclusive</td>
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<tr>
<td>Fenobarbital</td>
<td>SF 0,9%</td>
<td>Infusion 40 minutes, exclusive</td>
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<tr>
<td>Octreotida</td>
<td>SF 0,9%</td>
<td>Exclusive way</td>
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<td>Clonazepam</td>
<td>SF 0,9% ou AD</td>
<td>Dilute to the maximum tolerated</td>
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<tr>
<td>Levomepromazina</td>
<td>SF 0,9 %</td>
<td>Dilute to the maximum tolerated</td>
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<td>Metadona</td>
<td>SF 0,9 %</td>
<td>Change site every 24 hours</td>
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<td>Metoclopramida</td>
<td>SF 0,9 %</td>
<td>Dilute the maximum tolerated</td>
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<td>Midazolam</td>
<td>SF 0,9 %</td>
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<td>Morfina</td>
<td>SF 0,9 %</td>
<td>Dilute the maximum tolerated</td>
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<th>Medicines</th>
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Proposed Protocol Illustrated for Hipodermoclisis

<table>
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<tr>
<th>Drug</th>
<th>Concentration</th>
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<tr>
<td>Ampicilina</td>
<td>SF 0,9%</td>
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<td>Atropina</td>
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<td>Cefepima</td>
<td>SF 0,9%</td>
<td>Infusion 40 minutes</td>
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<tr>
<td>Cefotaxima</td>
<td>SF 0,9%</td>
<td>Infusion 30 minutes</td>
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<td>Cefazidima</td>
<td>SF 0,9%</td>
<td>Infusion 30 minutes</td>
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<tr>
<td>Ceftriaxona</td>
<td>SF 0,9%</td>
<td>Infusion 40 minutes</td>
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<tr>
<td>Ciclizina</td>
<td>AD</td>
<td>Incompatible with SF</td>
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<tr>
<td>Dicloranato</td>
<td>SF 0,9%</td>
<td>May cause local irritation</td>
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<tr>
<td>Diclofenaco</td>
<td>SF 0,9%</td>
<td>May cause local irritation</td>
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<tr>
<td>Diclofenaco</td>
<td>SF 0,9%</td>
<td>Slow bolus application</td>
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<td>Diclofenaco</td>
<td>SF 0,9%</td>
<td>Infusion 30 minutes</td>
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<td>Dipirona</td>
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<td>Escopolamina</td>
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<td>Famotidina</td>
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<td>Furosemida</td>
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<td>Bolus or Infusion Pump</td>
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<td>Haloperidol</td>
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<td>if &gt; 1mg / ml use AD at dilution</td>
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<td>Maropenem</td>
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<td>Naproxeno</td>
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<td>Incompatible with Morphine</td>
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<td>Olanzapina</td>
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<td>Ondansetrona</td>
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<td>Prometazina</td>
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<td>Ranitidina</td>
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<td>Tramadol</td>
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Source: Handbook of Hipodermoclisis 16 Adapted.

Subcutaneous administration of fluids, termed hypodermoclysis, offers an alternative method for rehydrating patients, and it is beginning to gain favor among practitioners in the long-term care setting because of its ease of use and minimal risk of side effects [17]. The administration of the medication still follows the intravenous use line, since until now, the most correct form for the preparation and administration to the patients has not been established; There are recommendations, for example, of 100% dilution, ie if the medication has 1 ml dilute with 1 ml of diluent [18].

However, this information is not yet a consensus for the use of all prescribed drugs, since each has its own profile in relation to dilution, stability and pH. Important facts to prevent adverse events [19]. This makes the procedure considered safe and effective with considerable risks. A large part of the adverse reactions that occur may relate, for example, to puncture sites and medications that are unsuitable for the chosen route of administration, inadequate dilution and lack of rotation of the puncture site that can be considered every 96 hours [20]. Of the drugs already indicated and commonly prescribed for the subcutaneous route, the majority is prescribed mainly based on the clinical practice. And literature is not always considered [21]. Therefore, we should evaluate the conditions of the patients before indicating this route of administration [22,23].

Thus, the illustrated and literature-based protocol with relevant information on medications, dilutions and pathways may be crucial for dissemination of the correct technique. In addition it can reflect the potential to help reduce the $1 billion annual US cost of avoidable hospitalizations for dehydration [24].
Conclusion

In relation to the objective of the research, it was possible to record the images of puncture sites, to demonstrate the sequence in which the technique should be performed, from the selection of materials; professional approach to the client; puncture and functionality tests of the access, directing its form of execution. It is possible to develop the elaboration of the illustrated protocol, facilitating the understanding of the possibilities of sites of the sites, in the following regions: subclavicular, deltoidea, abdominal, anterolateral of the thigh and interscapular.

Thus allowing the visualization of the technique, favoring the material and angulation for puncture. In addition to describing the important nursing care to be considered, such as: choice of materials, caliber of devices, test for puncture effectiveness, infusion functionality, monitoring after puncture, among others. It is important to emphasize the importance of broadening the discussion and conducting studies on hypodermoclisis, mainly to carry out studies that show the main difficulties encountered by the nursing team, in order to align the execution of the technique.

References