THE USE OF ANTI-SEPTIC SOLUTIONS: THE NURSE’S PRACTICE
O USO DAS SOLUÇÕES ANTISSEPTICAS: A PRÁTICA DO ENFERMEIRO

Amanda de Assunção Teodoro da Silva¹, Alessandra Mazzo², Lais Fumincelli³, Mirella de Souza Castelhano⁴, Carolina Beltr shri Bardivia⁵, Isabel Amélia Costa Mendes⁶

ABSTRACT
Objective: to ascertain nurses’ knowledge of antiseptic solutions and how they use them. Method: an exploratory-descriptive study with a quantitative approach, undertaken in December 2011 in two hospital institutions in the state of São Paulo (SP), Brazil, in which the nurses on duty were interviewed and the sectors using antiseptic solutions were observed. The data was stored in Excel, and analyzed and discussed with the literature, following the Research Ethics Committee’s approval of the research project under Protocol 1005/2009. Results: among the nine nurses and four units observed in institution A and the 38 nurses and 13 units of institution B, a low level of knowledge was observed in relation to good practice in the use of, and to the legal aspects regarding, antiseptic solutions. Conclusion: it is necessary for knowledge to be publicized for these products to be used better. Descriptors: Nurse; Nursing; Antiseptic; Antisepsis.

RESUMO
Objetivo: averiguar o conhecimento e como o enfermeiro utiliza as soluções antisépticas. Método: estudo exploratório-descritivo de abordagem quantitativa, realizado em duas instituições hospitalares do interior do estado de São Paulo (SP), Brasil, nas quais foram entrevistados os enfermeiros de plantão e observados os setores que utilizavam soluções antisépticas, em dezembro de 2011. Os dados foram armazenados no Excel, analisados e discutidos com a literatura, após a aprovação do projeto de pesquisa pelo Comitê de Ética em Pesquisa, Protocolo 1005/2009. Resultados: entre os nove enfermeiros e quatro unidades observadas na instituição A e 38 enfermeiros e 13 unidades da B, foi identificado baixo nível de conhecimento em relação às boas práticas de utilização e aos aspectos legais das soluções antisépticas. Conclusão: necessário que ocorra disseminação do conhecimento para melhor utilização desses produtos. Descriptores: Enfermeiro; Enfermagem; Antissepsia; Antisépticos.

ORIGINAL ARTICLE
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Antisepsis may be defined as a set of measures used to destroy or inhibit the growth of microorganisms in the superficial and deep layers of the skin or mucosa through applying germicidal agents, classified as antiseptics. The use of antiseptic solutions is significant in undertaking the clinical practice of nursing and in all health care contexts. For ethical, human and safe practice to be established, it is the role of the nurse to monitor the process of production and use of the solutions, through the use of institutional protocols which ensure their quality, efficacy and safety.1,2

The purpose of the antiseptic solutions is the preparation of the skin or the cleaning of the hands, and may precede invasive procedures such as surgery or the application of injections or urinary catheters, among others. To be efficient, they must be able to destroy all pathogenic agents found on the skin surface, to have good results at room temperature, and not to be either corrosive or toxic to human beings, besides having low causticity and hypoallergenicity.1,2 It is also necessary for them to have a wide antimicrobial spectrum, to be fast-acting, to have residual and cumulative effects, to have low systemic absorption, not to cause drying or irritation, and to be odorless or have a pleasant smell - as well as for them to be well-accepted by the users, to be low-cost, and to be distributed in functional, easy-to-use packaging. They must also have germicidal action on cutaneous-mucosal flora in the presence of blood, serum and secretions.3,4

The antiseptics must be protected from direct sunlight and high temperatures - which leads to the need for individual packaging for use in the shortest time possible. When contaminated, they are frequent sources of microorganisms involved in outbreaks of infection, a fact which reflects on the importance of establishing routines related to the acquisition, storage, handling and internal distribution of these products.5,6,7

OBJECTIVE

To ascertain what knowledge nurses have of antiseptic solutions and how the nurses use them.

METHOD

An exploratory-descriptive study with a quantitative approach, undertaken in two public hospital institutions in the state of São Paulo in December 2011. The institutions were a medium-size hospital, hospital A, made up of outpatient and inpatient units and an outpatient surgical center, and a large-size hospital, hospital B, characterized as a teaching hospital which provides pediatric and adult urgent and emergency clinical and surgical assistance.

The data collection instrument for observation was applied in all the clinics of the hospitals which use antiseptic solutions. Data collection was undertaken by the researchers themselves through structured observation and interviews. Four clinics were observed in hospital A, and thirteen in hospital B. In the observation, the antiseptic solutions used were identified and the data referent to the solutions’ storage, distribution, packaging and disposal was considered, in accordance with the recommendations put in place by the Ministry of Health.7,8

In the clinics observed, concomitantly, interviews were held, using a questionnaire with open and closed questions, in the three periods of the work day (morning, afternoon and night). All the nurses who agreed to participate in the research and who were on duty on the date stipulated for the researchers’ visit were included. In hospital A, 9 nurses participated in the study, and in hospital B, 38 nurses participated. The data from the interviews was collected using a questionnaire, which covered objective and discursive questions on the storage, distribution, packaging, use and disposal of the antiseptic solutions.

The analysis of the data from the interviews was undertaken using Microsoft Excel, through frequency and percentage analysis and in line with legislation and the literature in force on this issue. The data was presented in the form of tables and figures, and the discussion was undertaken in the form of a discursive report.

This study’s research project was approved by the Research Ethics Committee of the Ribeirão Preto School of Nursing - USP, in line with Resolution N. 196/96 of the National Commission for Research Ethics (CONEP) (Process 1005/2009).

RESULTS

Were interviewed 47 (100.0%) nurses in the two units, with 9 (19.2%) in unit A and 38 (80.8%) in unit B.

In relation to time since qualifying in hospital A, for 7 (77.8%) it is between two and six years, and for 2 (22.2%) from 12 to 16 years. In hospital B, 9 (23.6%) had qualified between 2 and 6 years previously, 10 (26.4%) between 7 and 11 years previously, 10 (26.4%)
The solutions indicated as being used in hospital A were: 13 (39.3%) degemer, alcoholic aqueous chlorhexidine, 9 (27.2%) 70% alcohol, 9 (27.2%) degemer and topical Povidone-Iodine (PVP-I), 1 (3.1%) hydropon peroxide and 1 (3.1%) benzene. In hospital B, 75 (51.3%) degemer and alcoholic chlorhexidine, 38 (26.0%) degemer and topical PVP-I, 22 (15.0%) 70% alcohol, 8 (5.5%) alcohol gel, 2 (1.3%) hydrogen peroxide and 1 (0.7%) sodium hypochlorite. There was more than one response per subject.

Regarding knowledge of the antiseptic solutions recommended by the Ministry of Health, the interviewees in hospital A responded that: 5 (44.5%) did not have knowledge and 4 (55.5%) stated that they knew the legal solutions. The solutions mentioned as legal were 7 (77.7%) topical, alcoholic and degemer chlorhexidine, 1 (11.1%) 70% alcohol and 1 (11.1%) PVP-I. There was more than one response per subject.

In hospital B, 21 (55.2%) said that they did not know the antiseptic solutions recommended, and 17 (44.8%) stated that they knew them. The solutions indicated were: 19 (59.3%) topical, alcoholic and degemer chlorhexidine, 7 (21.9%) PVP-I, 4 (12.5%) 70% alcohol, 1 (3.1%) liquid soap and 1 (1.1%) sodium hypochlorite. There was more than one response per subject.

When asked about non-authorized antiseptic solutions in the sector, 1 (11.1%) person interviewed in hospital A indicated benzene. In hospital B, 1 (2.6%) was not able to respond, and 1 (2.6%) indicated benzene, ether, and hydrogen peroxide.

The places indicated by the subjects for storing the antiseptic solutions in hospital A were: 6 (60.0%) the sector’s stockroom, 2 (20.0%) the storeroom and 2 (20.0%) the nursing station. In hospital B, 26 (50.0%) indicated the storeroom, 22 (42.3%) the nursing station, 3 (5.8%) the procedure room and 1 (1.9%) the toilet. There was more than one response per subject.

All the subjects from the two institutions, in hospital A 9 (100.0%) and in hospital B 38 (100.0%), stated that the solutions are stored in the original bottles.

The subjects’ responses in regard to lighting, temperature and humidity in the place of the antiseptic solutions’ storage are described in Table 2.

Among the subjects, 5 (55.5%) in hospital A and 18 (47.4%) in hospital B report that antiseptic solutions are manipulated in the sector. Of the professionals indicated in hospital A as responsible for the manipulating, 4 (66.7%) were from the nursing team and 2 (33.3%) were doctors. In hospital B, 18 (75.0%) indicated the nursing team, 5 (20.8%) the doctors, and 1 (4.2%) the cleaners. They also indicated that in hospital A, the solutions are manipulated: 2 (50.0%) with the use of gloves, 1 (25.0%) from the bottle to a container, 1 (25.0%) from the original bottle to a squeeze bottle. In hospital B, 9 (50.0%) transfer solutions from the original vials to almotolias, 6 (33.3%) mention the use of procedure...
The use of anti-septic solutions...

gloves, 3 (16.7%) mention avoiding contamination. There was more than one response per subject. The places indicated for the manipulation of the solutions were, in hospital A: 2 (25.0%) nursing station, 1 (12.5%) the operating room, 1 (12.5%) appointment rooms, 1 (12.5%) the pre- and post- consultation room, 1 (12.5%) the observation room, 1 (12.5%) the procedure room, and 1 (12.5%) could not answer. In hospital B, 8 (40.0%) indicated the nursing station, 6 (30.0%) the dressings trolley, 3 (15.0%) the patient’s bed, 2 (10.0%) the procedure room and 1 (5.0%) the medication room. There was more than one response per subject.

Regarding the place for storing the solutions in use, of the subjects from hospital A: 4 (44.4%) reported that there was no fixed place, 1 (11.1%) the appointment rooms, 1 (11.1%) the dressing room, 1 (11.1%) the utility room, 1 (11.1%) the observation room and 1 (11.1%) was not able to answer. In hospital B, 10 (26.3%) indicated the nursing station, 9 (23.7%) that there was no fixed place, 7 (18.4%) the medication room, 6 (15.8%) the drugs trolley and 6 (15.8%) were not able to answer.

All the interviewees from hospital A (9 - 100.0%) and hospital B (38 - 100.0%) stated that the bottle in which the solution in use is stored is the original bottle. In hospital B, 38 (100.0%) and in hospital A, 7 (77.7%) stated that the bottle is made of plastic. In hospital A, 2 (22.2%) could not state what material the solution’s bottle was made of.

Regarding the antiseptic solution’s period of validity, in hospital A, 5 (50.0%) stated that it does not have an expiry date, 3 (30.0%) could not answer, 1 (10.0%) stated one week, and 1 (10.0%) 30 days. In hospital B, 38 (66.6%) stated that it does not have an expiry date, 11 (19.2%) stated one week, and 8 (14.0%) could not answer. There was more than one response per subject.

In hospital A, the professionals indicated as responsible for replacing solutions in the places of use were: 8 (88.8%) the nursing team and 1 (11.1%) clerical staff. In hospital B, the professionals indicated were: 36 (87.6%) the nursing team and 5 (12.4%) the clerical staff. There was more than one response per subject.

The places for disposal indicated in hospital A were: 4 (30.7%) packaging goes in the normal trash, 3 (23.1%) purge, 3 (23.1%) state that there is no disposal, 2 (15.4%) mention the drains and 1 (7.7%) mention the return to the storeroom of expired materials. In hospital B, 20 (47.6%) mention white trash, 8 (19.0%) state that there is no disposal, 7 (16.7%), mention the drains, 5 (11.9%) the sluice and 2 (4.8%) mention cardboard boxes.

The observation in hospital A occurred in 4 sectors: two medicine clinics, one operating room and one outpatient center attending adults and children. In hospital B, observation was undertaken in 13 sectors, emergency/trauma room, emergency outpatient unit, clinical stabilization room, psychiatry, head and neck, the pediatric ward, infectious diseases outpatient unit, general medicine ward, the coronary care unit, surgical ward, the isolation ward, the neurology ward, and the Intensive Care Unit (ICU).

The data related to the observation of the antiseptic solutions in hospital A and in hospital B, according to authorization of the Ministry of Health, is represented in Figure 1.
The use of anti-septic solutions...

It may be observed that in hospital A, the bottles are kept on open shelves with no type of protection in the four sectors (100.0%) and in hospital B, in 7 (46.6%) sectors they are stored on open shelves with no type of protection, in 4 (26.6%) in the cupboard under the sink, in 1 (6.6%) in cardboard boxes, in 1 (6.6%) on the dressing trolley and in 1 (6.6%) on open shelves together with the cleaning products. More than one place of storage was observed per sector.

The antiseptic solutions are present in the nurses’ day-to-day, making it necessary to guarantee the processes of their use, with institutional processes ensuring their quality, efficacy and safety; however, in the two hospitals investigated, approximately half of the professionals interviewed stated that they did not know the solutions prescribed by the Ministry of Health (MS), also indicating the use of solutions in the services which are not legally authorized. The nurses studied also did not attribute importance to the norms regarding transport, storage and handling, which does not guarantee the product’s efficacy and leads to risks of contamination.\(^\text{2,14}\)

In 1983, the efficient use of antiseptic solutions was implanted and regulated through the Ministry of Health Resolution N. 196/83, in conjunction with the Program for the Control of Hospital Infection. This resolution was later revoked and substituted by Resolution MS N. 930/92.\(^\text{8,9}\)

The Ministry of Health prescribes the following as antiseptic solutions: isopropyl alcohol, alcohol gel, iodine solutions, iodophor solutions and chlorhexidine-based solutions.\(^\text{8,9}\) Isopropyl alcohol is one of the most-used antiseptic solutions. It has a virucidal effect when found in the concentration of 70% (w/v), and a bactericidal effect in a concentration of 92% (w/v). It is inflammable and needs to be stored at appropriate temperatures.\(^\text{10}\)

The iodine solutions have immediate and effective action. Those diluted in alcohol are used in surgical areas, in degemming the hands and forearms and in local antisepsis prior to invasive procedures.\(^\text{3}\) Polyvinylpirrolidion (PVPI) may be characterized as a low toxicity iodophor having outstanding antiseptic action, being found in the degemmant form (used for cleaning the operating site and the hands and forearms of the surgical team), the alcoholic form (for preparation of the skin prior to invasive procedures) and aqueous form (for application on mucosa).\(^\text{6,11}\)

Chlorhexidine may be found in aqueous form, with alcohol and degemming. It has low toxicity, and a high level of bactericidal action and antimicrobial interaction. It must always be protected from brightness and exposure to high temperatures, and must not be stored for more than one year.\(^\text{3,12,13}\)

Among the solutions which are not authorized by the Ministry of Health, and which must not be used as antiseptics, are formulations prepared with Dakin’s Solution (sodium hypochlorite solution 0.5%), acetone and hydrogen peroxide, which may be classified as toxic, have no microbicidal activity, are inactivated in the presence of organic material, and, furthermore, can damage granulation tissue.\(^\text{8,9}\)

DISCUSSION

The antiseptic solutions are present in the nurses’ day-to-day, making it necessary to guarantee the processes of their use, with institutional processes ensuring their quality, efficacy and safety; however, in the two hospitals investigated, approximately half of the professionals interviewed stated that they did not know the solutions prescribed by the Ministry of Health (MS), also indicating the use of solutions in the services which are not legally authorized. The nurses studied also did not attribute importance to the norms regarding transport, storage and handling, which does not guarantee the product’s efficacy and leads to risks of contamination.\(^\text{2,14}\)

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According to the interviewees, the use of antiseptic solutions is not restricted to the nurse-patient binomial, but extends to the health, administrative and support team, of whom the nurse takes on the position of manager of care. As leader, the nurse must seek quality of care and new knowledge and objectives, outlining norms and routines, mobilizing, discussing, and transmitting information to her team, always aiming for the safety of the patients.\textsuperscript{14}

The quality of nursing care is striven for as much during procedures as in any other type of activity directed at the patient. To this end, it is necessary for the nurse to re-think her practices, stance and knowledge sought and adopted at work, re-evaluating her behavior in the light of the innumerable responsibilities assigned to her.\textsuperscript{15} In relation to the antiseptic solutions, in the sample studied, there is no consensus in the indication of the professional responsible for this role; the significant activity of the clerical staff and storeroom staff in the process of storing, distributing and packaging of the solutions is evident, as is that of the nursing, health, medical and cleaning teams in their use and disposal.

From the data obtained, how the antiseptic solutions are used raises doubts as to the professionals’ scientific and legal knowledge of the issue, placing the patients, and the professionals themselves, at risk.\textsuperscript{2,15,16}

According to the Ministry of Health and manuals on good practice on the issue, in order to ensure the good use of antiseptic solutions, it is necessary for the products: to be acquired from reliable suppliers; to be transported protected from excessive heat, and in the quantities anticipated to be used; to be stored protected from direct sunlight, on pallets and/or closed shelves, with good visibility for identifying them and their expiry dates; and that in units where patients are attended, they should be used individually, changed weekly, remain with edge protection when opened and be clearly identifiable, with the name of the product and the date opened, and the professional responsible for opening the item. The observation undertaken demonstrates that in the two services studied, there are unauthorized solutions, in re-used containers, and whose use is shared; as well as a failure to observe the prescribed norms for storage, lighting, temperature and disposal.\textsuperscript{2,8,9,14}

Trained nurses provide rationalization for routines, as well as standardization and safety in the undertaking of the procedures which involve the use of antiseptic solutions. For them to take on this role, it is necessary for them to be involved in the planning of the solutions’ use, keeping up with new trends and technologies, constantly updating their knowledge and participating and contributing to the construction of alternatives which meet the challenges of offering quality services.\textsuperscript{17}

**CONCLUSION**

Although it is an important and major ally in the control of processes of hospital infection, the nurses’ knowledge in relation to the antiseptic solutions remains inadequate throughout the process, which was possible to diagnose in institutions of different size.

The use of antiseptic solutions is routine in patient care, and involves the entire methodology of various professionals. It is the nurse’s responsibility to ensure this procedure’s quality, through a proactive stance in protocols and educational and institutional processes with all those involved, condemning non-evidence-based practices and discarding illegal processes.

In the use of antiseptic solutions, so as to ensure the quality of patient care, it also falls to the institutions teaching nursing to include in their curriculums the scientific and legal aspects which lead to ethics in the care provided.

**FINANCING**

This study was undertaken with financial support from the São Paulo State Research Support Foundation (FAPESP). Ribeirão Preto (SP), Brazil.

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Submission: 2013/03/11
Accepted: 2013/11/06
Publishing: 2013/12/01

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