IMPLEMENTATION OF ALCOHOL-BASED SURGICAL HAND ANTISEPSIS: EXPERIENCE REPORT

Implantação de antissepsia cirúrgica alcoólica das mãos: relato de experiência

Implantación de uma antissepsia quirúrgica alcohólica de las manos: relato de experiencia

Juliana Prates[1], Ariane Batista Monteiro[2], Francyne Lopes[3], Diego Stumpfs[4], Gabrielli Guglielmi[5], Gabriel Narvaez[6], Roseli Cristofolini Bobsin[7], Rita Catalina Aquino Caregnato[8]

ABSTRACT: Objective: To describe the experience of surgical alcohol-based antisepsis on hand preparation of the surgical team. **Method:** Reporting the experience on deployment of alcohol solution for surgical hand antisepsis to replace brushing, during December 2014–July 2015. **Results:** Product was selected upon documentation analysis and application trial. Alcohol-based antisepsis was offered as alternative to the use of brushes impregnated with antiseptic. Scientific papers and advertising posters were available to the professionals. A total of 282 procedures were observed. The adherence rate to the alcohol solution ranged from 33% in the month of implementation to 54%, and compliance to the proper technique was observed in only 35.8% of cases. **Conclusion:** There was considerable adherence to the alcohol-based solution; it was observed as well economic impact and increasing of training demand for the right technique. There is a need to identify motivation factors and barriers for the successful implementation of this technology.

Keywords: Antisepsis. Infection. Nursing.

RESUMO: Objetivo: Relatar a experiência de implantação do antisséptico alcoólico para o preparo das mãos da equipe cirúrgica. **Método:** Relato de experiência de implantação de solução alcoólica para antissepsia cirúrgica das mãos em substituição a escovação, durante os meses de dezembro de 2014 a julho de 2015. **Resultados:** A escolha do produto baseou-se na análise de documentação e testes de utilização. O antisséptico alcoólico foi oferecido como alternativa à utilização das escovas impregnadas com antisséptico. Foram disponibilizados artigos científicos e cartazes para os profissionais. Observou-se 282 procedimentos. A taxa de adesão à solução alcoólica variou de 33% no mês da implantação a 54% e a adesão à técnica correta foi observada em apenas 35,8% das oportunidades. **Conclusão:** Houve considerável adesão à solução alcoólica e observou-se impacto econômico e demanda de capacitações para a técnica correta. Há necessidade de identificar fatores mobilizadores e barreiras para a implantação dessa tecnologia.

Palavras-chave: Antissepsia. Infecção. Enfermagem.

RESUMEN: Objetivo: Relatar la experiencia de implantación del antiséptico alcohólico para la preparación de las manos del equipo quirúrgico. **Método:** Relato de la experiencia de implantación de la solución alcohólica para la antisepsia quirúrgica de las manos en reemplazo del cepillaje, entre diciembre de 2014 a julio de 2015. **Resultados:** La elección del producto se fundamentó en el análisis de la documentación y ensayos. El antisséptico fue ofrecido como alternativa a los cepillos. Fueron disponible artículos científicos y carteles para los profesionales. Fueron vistos 282 procedimientos. La adhesion a la solución alcohólica varió del 33% en el mes de la implantación al 54% y la adhesión a la técnica correcta fue observada en 35,8%. **Conclusión:** Hubo considerable adhesión a la solución alcohólica y se observó un impacto económico y demanda de capacitaciones para la técnica correcta. Hay necesidad de identificar los factores mobilisadores y barreras para la implantación de esta tecnologia.

Palabras clave: Antisepsia. Infeccion. Enfermería.

[1]Nurse. Specialist in Health Management. Master Student in Health Education of the Professional Master's Program in Health Teaching (PPGENSAU) of the Universidade Federal de Ciências da Saúde de Porto Alegre (UFCSPA). E-mail: jugilprates@gmail.com.
[2]Nurse in the Hospital Infection Control of the *Irmandade Santa Casa de Misericórdia* of Porto Alegre. E-mail: ariane.monteiro@santacasa.tche.br.
[3]Nurse, specialist in Nursing Services Management, nurse at the Hospital Infection Control Service of the *Hospital Mãe de Deus*. E-mail: francynelopes@yahoo.com.br.
[4]Nurse at the Hospital Infection Control Service of the *Hospital Mãe de Deus*. E-mail: diego.stumpfs@maededeus.com.br.
[5]Nurse at the Hospital Infection Control Service of the *Hospital Mãe de Deus*. E-mail: gabrielli.guglielmi@maededeus.com.br.
[6]Infectious Disease Physician at the Hospital Infection Control Service of the Hospital Mãe de Deus. E-mail: gabriel.narvaez@ maededeus.com.br.
[7]Nurse, specialist in Health Services Management. Coordinator of the Surgical Service. E-mail roseli.cristofolini.
[8]Nurse. PhD in Education. Permanent Professor of the Professional Master's Program in Health Teaching (PPGENSAU) of the Universidade Federal de Ciências da Saúde de Porto Alegre (UFCSPA). E-mail: ritac.ufcspa@gmail.com.
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INTRODUCTION

Surgical infections are complications that may occur in surgical procedures, representing a relevant impact in morbidity and mortality of the patients, in addition to increasing hospital costs[1]. Preventive actions to avoid these events are indicated, such as the use of surgical scrubs[2], degermation, and hand antisepsis of the surgical team — this last one as the main measure. This recommendation takes on greater relevance from the knowledge that, at the end of the procedure, about 18% (varying from 5 to 82%) of surgical gloves have microperforations, and most part of the situations (80%) is not noticed by the surgeons[3]. Besides that, after two hours of surgery, 35% of gloves have perforations that may allow the passage of water and body fluids[4], which may double the risk of developing postsurgical infections. Thus, safe practices for hand sanitization by the surgical team are essential.

The use of brushes impregnated with antiseptics represents the traditional method for hand antisepsis before surgery[5]; however, the alcoholic preparations have been widely recommended[6]. The World Health Organization (WHO) [6] states that the preparations with high alcohol concentrations ensure such a drastic reduction of the microbial concentrations (resident flora) in the hands of the team that it would take more than six hours for the baseline levels to be reached[6]. This fact would make the discussions comparing the residual effect of alcohol with antiseptic soaps superfluous. Besides, the WHO[6] emphasizes other advantages of the use of these alcoholic agents, such as less time spent in presurgical hands preparation, less dermatological effects, economy in the use of resources such as water and compresses, in addition to less production of waste. Moreover, the Centers for Disease Control and Prevention (CDC) recommends the use of alcoholic solutions emphasizing the same benefits[7].

The alcoholic preparations are used in Europe for at least 30 years[8]. In addition to the European continent, in the United States of America, there are also standardized tests to measure the antimicrobial spectrum of the alcoholic solutions[9]. Despite all the favorable evidences, in Brazil, the use of alcoholic solutions to replace the brushing of hands is not widely used, whether by the preparatory ritual it represents or by the impression that a vigorous brushing is needed in order to eliminate the microbial flora[9].

Acting out in a private hospital striving for excellence, innovations, and owing to the reasons exposed previously, the teams of the Surgical Center (SC) and the Infections Control Service (HICS) agreed to implement the alcohol-based antiseptics for preoperative preparation of the hands to substitute brushing. Owing to its being a practice with evident benefits, however recent and still little inserted in the institutions of the country, there is a need to encourage the discussion on this alternative assistance. For such, there is the purpose of this study, which was focused on reporting how the process happened and what are the economic impacts of the implementation of the alcohol-based surgical antiseptics in a private institution.

OBJECTIVE

Reporting the experience of implementing the alcohol-based surgical hand antisepsis of the surgical team.

METHOD

This is a report of the experience of implementing the alcohol-based surgical hand antisepsis of the surgical team to replace brushing. The setting of this experience was the SC of a private hospital in Southern Brazil, with an open clinical body, with 13 operating rooms and which performs, on average, 1,500 anesthetic-surgical procedures per month. Approximately 100 surgeons (20% of the professionals registered) account for 80% of the production of the SC, and count on 7 nurses and 100 nursing technicians.

The implementation process of the alcohol-based solution occurred between the months of December 2014 and July 2015. The antisepsis selected consisted of ethylic alcohol at 70% (p/p) in gel form.

Professionals working in the SC of the institutions were involved in this process (surgeons and scrub nurses) and they were trained by the technician of the supplying company of alcohol-based solution for the execution of the technique, under the supervision of the HICS.

After the implementation of the alcohol-based solution for antisepsis, the HICS collected data on the adherence to the technique, by means of the direct observation of the procedure (preoperative hand antisepsis), performed by the academic nursing interns working in the HICS, using a data collection form (Appendix 1).

The variables considered in the observation were: professional category, product chosen for hand antisepsis, duration of the procedure, and technique used. In order to be considered appropriate, the procedure with alcohol-based solution should last 2–3 minutes and with brushes, three–five minutes.

The guided technique for the alcohol-based surgery antisepsis followed the recommendations from the WHO[6], meaning, at least the six basic steps for simple hand hygiene, in addition to the additional steps to contemplate the forearms. Besides, hands should be kept moist during the frictioning and, for such, there should be ensured the necessary amount of product, about 15 mL. For the procedure with the brushes impregnated with antiseptics, the brushing should reach all the areas of the hands, including finger nails, and forearms, keeping them above elbows.

Information on the economic impact was obtained from institutional reports.

REPORTING ON THE IMPLEMENTATION OF ALCOHOL-BASED SURGICAL ANTISEPSIS

The use of the traditional method of brushing does not have a negative impact on the rates of surgical infection; however, some professionals with experiences in foreign countries, especially Europeans, reported using an alcohol-based solution and suggested its adoption. Besides, the institutional development of strategies for the rational use of environmental resources mobilized the management of the SC and the HICS, which identified in the use of this alcohol-based solution an opportunity which would meet these objectives, especially the potential saving of water. The perspective of financial savings, from the comparison of costs of the alcohol-based solution and the brushes, also motivated the managers of SC for the replacement process.

In order to choose the product, the following variables were analyzed: documentation, records, and tests for antimicrobial efficacy presented by the representatives, economic viability, and usage test by the SC professionals. After the evaluation of the documentation, two alcohol-based products were tested, and the choice of the product for implementation was based on the reports of professionals who tested them, considering the sensation after the applications and the easiness of the execution of the technique. All the analysis mentioned earlier was conducted according to the principles of the institutional protocol for product standardization, managed by the sectors of pharmacy, governance, SC, and HICS.

Strategically, it was chosen for including the alcohol-based antiseptic as an alternative to the use of brushes impregnated with chlorhexidine, although without restricting their use. In contrast, there was a sensitization movement for the use of the alcohol-based antiseptic, providing scientific articles, banners, and performing all the discussions with the professionals, presenting their advantages over brushes. For the initial implementation, dispensers of alcohol-based solution in all the SC lavatories were available together with banners containing guidelines on the correct technique.

In the period analyzed, 282 surgical antisepsis procedures were evaluated, being 203 (72%) of them performed by surgeons and 79 (28%) of them by scrub nurses.

In relation to the product used, 106 (38.1%) professionals chose to use the alcohol-based solution for surgical antisepsis in comparison to 172 (61.9%) professionals who chose to use brushes impregnated with degerming chlorhexidine. The adherence rate to alcohol-based solution varied from 33% in April 2015 (month of the implementation) to 54% in July 2015.

By professional category, the mean adherence to the use of the alcohol-based solution by the surgeons was of 33.5% (67/200), with a variation between 18% in June 2015 and 50% in July 2015. On the other hand, the mean adherence of scrub nurses was 50% (39/78), being observed an increasing growth during the evaluated months, varying from 25% in April to 64% in July 2015.

In order to indentify the adherence to the correct technique (procedure and time) of surgical antisepsis with alcohol-based solution and with impregnated brushes, a direct observation of the HICS process was performed, especially in relation to the time of duration and the procedures used. The adherence to the correct technique with the use of the alcohol-based solution was 35.8% (38/106) and with the use of brushes, 30.8% (53/172).

The surgeons performed the correct technique more often when using the alcohol-based solution (34.3%) in comparison to the brush (31.5%). This result was also observed among scrub nurses who reached 33.3% with alcohol-based solution and 25.6% using brushes.

Duration of friction was the main observed failure (94.2%) among the variables evaluated with the objective to classify the alcohol-based process as appropriate, followed by incorrect procedure (28.5%). This inadequacy was also observed in brushing with chlorhexidine, being the duration of brushing the most frequent flaw (97.4%), followed by incorrect procedure (7.5%).

An average of 6,500 units of impregnated brushes has been used until the implementation of the alcohol-based antisepsis to serve an average of 1,500 surgical procedures. The unitary cost of the brushes represents R$ 1.12, totaling a mean monthly cost of R$ 7,280.00. The alcohol-based antisepsis represents a cost of R$ 144.59 per refill and a total of

R$ 2,747.21 in the first month. From the incorporation of the alcohol-based antiseptics, there was a reduction in the consumption of 3,000 brushes, representing a cost reduction of R$ 3,360.00 and alcohol-based solution consumption of six refills costing R$ 867.54 — meaning, there was a reduction of cost of R$ 2,500.00 in the first month.

After the first month of implementation, the financial results were satisfactory, with a progressive reduction in the consumption of brushes.

DISCUSSION

The surgical hand antisepsis has been part of a ritualistic process of the surgical act recommended since the studies by Joseph Lister in 1865. At that time, surgical gloves were not yet in use, which made this practice even more imperative[3].

During the period of the study, there was a mean adherence to the alcohol-based solution of only 38.1%, which may be explained by the tradition of using brushes, added to the fact that they remain available. However, 54% of the procedure was performed with an alcohol-based solution during the month with the highest adherence. The acceptance of surgeons, which reached 50%, was attributed to the access of these professionals to publications about the broad use of the alcohol-based solution and the previous experiences with the product in hospitals in Europe and the United States of America. Evidence showed that when alcohol-based solutions are used by surgeons in the preoperative preparation of the hands, they reduce the bacterial counting faster and more effectively than the common or the antibacterial soap[10].

The introduction of surgical antiseptics without the use of water also provides opportunities to the surgical teams to improve their performances without compromising patient safety by means of the reduction of the time spent on hand preparation, with less skin damage and reduction of microbial burden[11]. In the evaluations performed in this study in relation to the technique and time to perform the surgical hand antisepsis process, it was identified that when using the alcohol-based solution, only 35.8% of the team performed the process correctly, considering frictioning duration as the most frequent inadequacy, which occurred in 94% of observations. The WHO[6] recommends that the antisepsis with alcohol-based solution for 2–3 minutes has microbial burden reduction in acceptable levels; however, it mentions that, in a recent study, 90 seconds of friction would equal 3 minutes, depending on the solution composition.

Being a newly available product in Brazil and yet little known by professionals, failures in the process were expected, what was evidenced during the observations. This fact is not in agreement with the findings in the literature where the use of alcohol-based solutions is reported as favorable to a better adequacy to the technique, in addition to the time reduction to perform the procedure and lower irritability of the skin, due to the addition of moisturizing and emollient substances in the formulations, contributing for the integrity of the epidermis[11].

Considering that the bushing process was carried out in the institutions for a long time, it was not expected the occurrence of failures in the technique. However, during the implementation process, it became necessary to compare the new method to the traditional one, and the adequacy of the technique of surgical brushing started to be observed. It was identified only 30% of compliance, compared with 35.8% of the alcohol-based solution. Randomized study[12], which evaluated the infection rates of the surgical site during 30 days with the use of the traditional brushing method *versus* the use of friction with alcohol-based solution, demonstrated compliance rates in relation to the duration of the procedure were inappropriate for both protocols; however, it was significantly better in the protocol of alcohol-based solution use than in the traditional brushing protocol (44 *versus* 28%, respectively; $p = 0.008$)[12].

The economic impact for the head institution of this study was noticed from the considerable reduction in the consumption of brushes. In a research in which the costs were measured with the use of the alcohol-based solution in comparison to brushing, it was demonstrated that the savings could reach 47%[4].

FINAL CONSIDERATIONS

This article allowed the reporting of the experience of a SC that carried out the replacement of the surgical brush by the use of the alcohol-based solution for hand antisepsis of the surgical team. This replacement corroborates with international evidence of benefits and brought advantages in terms of time saving, consumption of resources, and costs. Despite that, it was possible to observe that opting for this technique is not natural inside the teams and it deserves

efficient institutional mechanisms in order to raise awareness and develop the professionals. Based on this report, it became essential to identify, in subsequent studies, the profile of the professionals who chose the alcohol-based solution over brushes, in order to identify the mobilizing factors and barriers for the implementation of this technology.

With regard to the technique, the conduction of this implementation allowed the monitoring of the procedure with alcohol-based solutions and the conventional brushing, being possible to identify important failures in both procedures, reinforcing the demand for attention and recurrent training, in order to ensure patient safety.

The alcohol-based solution is not widely used in Brazilian institutions, and the predisposing factors for this reality should be further investigated. In this implementation report, it was not possible to properly evaluate the impact in all positive variables mentioned earlier, especially in relation to the quality results and social and environmental impacts. The identification of these effects is a priority as it supports the option for this recently available technology to hospital institutions.

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Appendix 1. Data collection form about surgical hand antisepsis

Hospital infection control service

Instrument of adherence to hand degermation

SURGICAL BLOCK

Evaluator: ______________________________

Date: / / Shift: ______________________________

Oport.		Hand degermation		Action		Technique		Flaw	
	Surg		Yes		Brush		Appropriate		Technique
	Instr		No		Alcohol		Inappropriate		Time
									Repetition

Oport.		Hand degermation		Action		Technique		Flaw	
	Surg		Yes		Brush		Appropriate		Technique
	Instr		No		Alcohol		Inappropriate		Time
									Repetition

Oport.		Hand degermation		Action		Technique		Flaw	
	Surg		Yes		Brush		Appropriate		Technique
	Instr		No		Alcohol		Inappropriate		Time
									Repetition

Oport.		Hand degermation		Action		Technique		Flaw	
	Surg		Yes		Brush		Appropriate		Technique
	Instr		No		Alcohol		Inappropriate		Time
									Repetition