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ORIGINAL ARTICLE

Operating room fire: Should we mistrust alcoholic antiseptics?



Brûlures par flamme au bloc opératoire : faut-il se méfier des antiseptiques alcooliques ?

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Summary Surgical site infections are a challenge for public health. One of the keystones of prevention is the skin preparation of the patient. Alcoholic antiseptics are presented as the best solution. But the adverse effects attributed to them must not be overshadowed by the exclusive benefit of their microbiological performance. The authors report four cases of severe burn having occurred in the operating room after skin antiseptics performed with an alcoholic antiseptic. The mechanisms of these accidents and preventive measures are reviewed. It concerns the restriction of ignition factors during use and the strict conformity to drying time. These potentially dramatic complications can and should be avoided. Probably underestimated, burns due to ignition of alcoholic antiseptics should appear more clearly in the evaluation of the risk–benefit balance.

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MOTS CLÉS

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Résumé Les infections de site opératoire représentent un défi en matière de santé publique. Une des mesures préventives les plus importantes est la préparation cutanée de l'opéré. Les antiseptiques alcooliques sont présentés comme la meilleure solution mais leurs effets indésirables graves ne doivent pas être occultés au profit de leur seule efficacité microbiologique.

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gique. Les auteurs analysent quatre cas de brûlures graves par inflammation d'antiseptique alcoolique en cours d'intervention chirurgicale. Les mécanismes de ces accidents et les mesures préventives sont explicités. Il s'agit de la diminution des facteurs d'allumage et du respect scrupuleux des temps de séchage. Mettant potentiellement en jeu le pronostic vital, ces accidents peuvent et doivent être éradiqués. Probablement sous-estimées, les brûlures par inflammation d'antiseptique alcoolique doivent apparaître davantage dans l'évaluation du rapport bénéfice–risque de leur utilisation.

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Introduction

Surgical Site Infections (SSI) are defined by the appearance of abnormal inflammatory signs related to the contamination of the operative site within 30 days after a surgical act or an invasive diagnostic procedure. This period is extended to 1 year in case of installation of prosthetic material. Three lesional levels are described, directly correlated to the severity of the infection. Superficial infections are the most common (60% of SSI); they involve the skin and subcutaneous tissue. Deep lesions, found in 29% of cases, affect the fascia and muscles. In France, SSI represent 14% of nosocomial infections [1]. Lethality reaches 1.8% and the reintervention rate is around 30%. The most involved operations concern, in order: genito-urinary, visceral (mainly colorectal) and gynaecological surgery. Germs are mainly from endogenous origin [2]. Representation is dominated by gram-positive cocci (47%) and *Enterobacteriaceae* (38%). Other gram-negative bacilli represent 8% and anaerobic 5%.

Antiseptic protocol in the operating room is one of the most important factors for the prevention of SSI. The use of antiseptics in surgery started with phenol in 1867 by Sir Joseph Lister. Since then, much progress has been made and the antiseptics are divided into different classes according to their active molecule (Table 1). Only formulations of povidone iodine (iodophor halogen type) and chlorhexidine (biguanide) are authorized for the preparation of the operative zone [3]. They exist in aqueous and alcoholic presentations in both cases. WHO and national health agencies recommend the use of an antiseptic soap and an antiseptic solution from the same class, usually in two successive applications respecting a defined drying time [4]. Alcoholic

antiseptics are considered more efficient than aqueous formulations but they expose patients to specific adverse events, of which the most important is the iatrogenic burn.

The aim of the study is to provide elements to redefine the risk–benefit balance in the use of alcoholic antiseptics for surgical disinfection.

Material and method

The study is retrospective. Clinical cases presented are taken from the exhaustive querying of the database of the Burn Unit of Lille. They represent a consecutive series of a 20-year period, between 1991 and 2011.

The criterion for inclusion is the iatrogenic character of the burn due to the inflammation of a surgical antiseptic. Other causes of burns in the operating room were excluded: contact, electric arc, and chemical burn upon contact with alcohols, solvents or adhesives without ignition.

The judging criteria for the analysis of clinical situations were collected from the medical records, sometimes supplemented by telephone contact with the patient and/or the surgeon: type, indication and conditions of operation, depth, surface and management of burns and extent of sequelae.

Results

We present four clinical cases of iatrogenic burns having occurred in the operating theatre during the time of the study.

Table 1 Properties of the different classes of antiseptics.

Classes of antiseptics	Surgical preparation	Bact. activity	Mycobact. activity	Antiviral activity	Fungicide activity	Sporicide activity
Chlorine	No	+	+	+	+	+
Iodine	Yes	+	+	+	+	+
Biguanide	Yes	+	–	±	+	–
Alcohols	No	+	+	±	±	–
Quaternary ammonium	No	+	–	±	+	–
Carbaniline	No	±	–	–	–	–
Diamidine	No	±	–	–	–	–
Hydrogen peroxide	No	±	+	±	±	±

Bact.: bactericide; Mycobact.: mycobactericide.

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