Disinfection for infection prevention over the course of time

Desinfektion als Infektionsprävention im Wandel der Zeit

Abstract

In recent years and decades increasingly more emphasis has been placed on alcohol-based solutions for hygienic and surgical hand disinfection. Traditional handwashing with soap and water has been largely replaced in the everyday clinical setting, as has the use of disinfectant soap-based solutions for surgical hand disinfection. It has been possible in recent years to reduce the exposure time for alcohol-based hand disinfection in surgery from 5 to 3 minutes, and there are plans to reduce this even further. The growing awareness of the tolerability issues has also given rise to favorable developments here. There have also been dramatic changes in preoperative skin disinfection. The non-alcoholic solutions with a slow onset of action (e.g. iodophors) have been virtually replaced by alcohol-based solutions of demonstrated efficacy. Non-alcoholic solutions continue to be used for disinfection of mucous membranes, but iodine-based products are being phased out here. The term “instrument disinfection” has been largely supplanted now by the expression “instrument reprocessing or medical device decontamination” (which is also underpinned by legislation) and it takes account of the trend towards thermal disinfection. Meticulous cleaning is thus an indispensable precondition for sterilization, which normally follows disinfection.

The greatest lack of consensus at European level relates to surface disinfection. Routine, parallel cleaning and disinfection of all surfaces close to and remote from the patient is being increasingly replaced by selective disinfection, whenever warranted, of surfaces close to the patient. The problem here is that medical personnel continue to view cleaning and disinfection as interchangeable tasks. This situation is further compounded by the fact that hospitals are finding it increasingly more difficult to assure adequately successful cleaning and disinfection outcomes. To ensure effective infection control, cleaning and disinfection of surfaces in special situations must also be assured whenever warranted outside the regular working hours.

Disinfection and decontamination of highly complex medical devices that pose special challenges (heat-sensitive devices with an intricate design and, correspondingly, with surfaces that are difficult to access, e.g. flexible endoscopes) will present the main challenge in the future. There is still much to be accomplished here to assure the hygienic safety of the patient.

Zusammenfassung

Die Anwendung alkoholischer Lösungen im Bereich der Hygienischen und Chirurgischen Händedesinfektion hat sich in den letzten Jahren und Jahrzehnten immer mehr durchgesetzt. Das herkömmliche Händewaschen mit Wasser und Seife wurde im klinischen Alltag praktisch völlig ersetzt, ebenso wie der Einsatz desinfizierender Seifenlösungen als chirurgische Händedesinfektion. Die Anwendungszeit der alkoholischen Händedesinfektion im OP konnte in den letzten Jahren von 5 auf 3 Minuten reduziert werden, weitere Entwicklungen stehen bereits an.
Die zunehmende Sensibilisierung in Bezug auf die Verträglichkeit hat auch hier bereits erfreuliche Lösungen gebracht. Dramatisch auch der Wandel bei der präoperativen Hautdesinfektion: Die nur langsam wirkenden nicht-alkoholischen Lösungen (z. B. Jodophore) sind durch alkoholische Lösungen mit sicherer Wirkung nahezu vollständig ersetzt. Die Schleimhautdesinfektion blieb eine Domäne der nicht-alkoholischen Lösungen. Hier deutet sich eine Ablöse der jodhaltigen Produkte an. Der Begriff der ‘Instrumentendesinfektion’ ist durch den Begriff der ‘Aufbereitung’ bzw. der Medizinprodukteaufbereitung ersetzt worden und beschreibt damit den (auch von der Gesetzgebung unterstützten) Trend zur apparativen, thermischen Desinfektion. Die exakte Reinigung wurde damit die unabdingbare Voraussetzung für die meist an die Desinfektion anschließende Sterilisation. Die größte Uneinigkeit innereuropäisch herrscht in Bezug auf die Flächen desinfektion. Die routinemäßige, parallele Reinigung und Desinfektion sämtlicher patientennahen und patientenfernen Flächen wird zunehmend abgelöst von der gezielten, Anlass bezogenen Desinfektion patientennaher Flächen. Problem dabei ist, dass das medizinische Personal aus der Tradition heraus nach wie vor Reinigung und Desinfektion gleichsetzt. Dazu kommt, dass es unter den aktuellen ökonomischen Vorgaben des Spitalsbetriebs immer schwieriger wird, einen ausreichenden Reinigungs- und Desinfektionserfolg sicherzustellen. Reinigung und Desinfektion der Flächen müssen insbesondere in Anlasssituuationen auch außerhalb der Regeldienstzeit für einen hygiene-sicheren Betrieb gewährleistet sein.

Die zentrale Herausforderung der Zukunft bleibt die Desinfektion bzw. Aufbereitung hoch entwickelter medizinischer Instrumente mit speziellen Anforderungen (thermolaible Güter mit kompliziertem Aufbau und dadurch schwer zugänglichen Oberflächen, z. B. flexible Endoskope). Hier gilt es noch viel Arbeit zu leisten für eine tatsächliche Patienten-Hygenesicherheit.

Text

The paper takes a look at the current role of hand and skin disinfection as well as of surface and instrument disinfection in our institution in the context of hospital infection control.

Hand disinfection

In recent years and decades increasingly more emphasis has been placed on alcohol-based solutions for hygienic and surgical hand disinfection. Traditional handwashing with soap and water has been largely supplanted in the everyday clinical setting by the use of alcohol-based hand disinfection. The use of soap-based solutions for surgical hand disinfection is now virtually obsolete and has been replaced by a combination of washing with a non-disinfectant soapy solution, followed by alcohol-based hand disinfection. Thanks to an enhanced application technique as well as to better knowledge of its mechanism of action, it has been possible in recent years to reduce the exposure time for alcohol-based hand disinfection in surgery from 5 to 3 minutes. Even halving this application time to 1.5 minutes is being currently debated. For practical reasons, we take a very critical view of this proposal at the moment (compliance!).

Furthermore, at an age where there is growing awareness among medical personnel of the tolerability profiles of chemical products, manufacturers and infection control teams are called upon to develop and use skin and hand disinfectants that will find acceptance among users. See: [1], [2]; ÖNORM EN 1500; Einwirkzeiten nach ÖGH-MP und DGHM.

Skin/mucosa disinfection

The most dramatic change seen here over the past twenty years has been in preoperative skin disinfection. In this domain, because of their longer onset of action and their limited spectrum of efficacy, the non-alcohol-based solutions (e.g. iodophors) have been virtually replaced by alcohol-based solutions. Conversely, non-alcohol-based solutions, especially the iodophors which have been used here without any reservations for decades, continue to be used for disinfection of mucous membranes. In the form of octenidine, an iodine-free product has also been used here with comparable efficacy in recent years. See: [3].
**Instrument Disinfection**

The term “instrument disinfection” has been largely supplanted now by the expression “instrument reprocessing or medical device decontamination”. On the one hand, the new nomenclature reflects the current role of instrument processing while, on the other hand, it takes account of the trend towards thermal disinfection and the sharp decline in chemical disinfection. Today, both processes are by all means being implemented in the form of automated decontamination/reprocessing (using washer-disinfectors). In recent years meticulous cleaning has also been identified as an indispensable precondition for the sterilization processes, which normally follow disinfection. The problems associated with prions have been responsible for taking a closer look at the cleaning-step component in instrument decontamination. These insights have also given rise to the formulation of pertinent standards (e.g. the Austrian standard ÖNORM EN ISO 15883), to which the Medical Devices Act (MPG) makes reference. See: MPG; ÖNORM EN ISO 15883; Richtlinie des RKI: Aufbereitung von Medizinprodukten; Richtlinien von ÖGSV und DGSV.

**Surface Disinfection**

The greatest lack of consensus at European level regarding the scope of the measures needed relates to surface disinfection. While throughout the entire last century, reflecting the drive towards maintenance of asepsis outside the surgical department, the customary practice in German-speaking countries was to disinfect regularly all surfaces close to and remote from the patient in the firm belief of thus being able to eliminate all potential inanimate microbial sources, today there is widespread consensus that these non-selective measures should be replaced by selective disinfection of surfaces close to the patient, bearing in mind the prevailing situation. The only points of the debate to be still resolved are the scope and frequency of such measures. Today, we find ourselves confronted with two problems. As a relic dating back to the tradition of using a disinfectant to clean all surfaces, disinfection and cleaning are often viewed by medical personnel as equivalent tasks, with no distinction being made between the different objectives of the two tasks. There is need for enlightenment here, whereby cleaning and disinfection are clarified as two separate functions. This problem is further compounded by a second reality, i.e. in view of their current economic hardships the hospitals are finding it increasingly more difficult to assure adequately the success of cleaning, and in some cases also of disinfection, measures.

Here of course the main focus must be on the microbial transmission pathways which are largely known, however, this should not mean that cleaning as an overall maintenance strategy is neglected. To ensure effective infection control, cleaning and disinfection of surfaces in special situations must also be assured whenever warranted outside the regular working hours. This calls for selective investment of the available resources to assure patient safety.

Disinfection and decontamination of highly complex medical devices with special needs (heat-sensitive devices with an intricate design and, correspondingly, with surfaces that are difficult to access, e.g. flexible endoscopes) will present the main challenge in the future. There is still much to be accomplished here to assure the hygienic safety of the patient. See: [4].

**Curriculum Vitae**

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Figure 2

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1999 he became specialist for hygiene and microbiology,
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