Endoscope sterilising — a change for the better

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Over the past decade, growing concern about the risks posed to clinical staff by exposure to glutaraldehyde-based disinfectants has prompted many hospitals to seek alternative means of ensuring the microbiological safety of those instruments, such as flexible endoscopes, that are unable to withstand steam sterilisation and autoclaving procedures.

The recent withdrawal from the market of certain glutaraldehyde-based products has forced the pace of change for many people who are now faced with a radical rethink of their disinfection procedures and a range of alternative technologies from which to choose.

All theatre and nursing personnel are now well aware of the risks posed by prolonged, regular exposure to glutaraldehyde, as indeed are occupational health practitioners. With the advent of effective alternatives, there can be little reason for its continued use.

At Chase Farm Hospital in the late 1990s we were one of the first to make the change to a novel chlorine dioxide technology (Tristel). This is now well established and has since become available in a range of formats, making it suitable for use throughout the Trust in departments whose needs may differ from one another. As well as the health and safety benefits, using Tristel solutions brought an immediate reduction in turnaround time for endoscopes and, most critically, it offers the benefits of true sterilisation as opposed to the high level disinfection previously achieved with glutaraldehyde.

caption

CONSEQUENCES

Looking back to the 1980s, there was little thought that exposure to glutaraldehyde, whether through breathing the fumes or immersing unprotected hands, would have long-term consequences. A cheap and effective disinfectant, it was in universal use. In the early 1990s, however, an increasing number of successful compensation claims raised general awareness of the safety issues surrounding its use.

As a direct response to the growing body of evidence of health and safety problems, the Health & Safety Executive (HSE) imposed a Maximum Exposure Level (MEL) on glutaraldehyde of 0.02%.

However, at the time there was no effective alternative, although new products were beginning to emerge.

In 1998 a combination of events prompted us to examine different options for endoscope disinfection. That year the British Society of Gastroenterology issued a report on the cleaning and disinfection of endoscopes (BSG Working Party Report 1998; The Report of a Working Party of the British Society of Gastroenterology Endoscopy Committee, Cleaning and disinfection of equipment for gastrointestinal endoscopy, 1998; 42;585-93) recommending an increase in immersion times for endoscopes disinfected using 2% glutaraldehyde from 4 minutes to 10 minutes between uses. This posed an immediate problem in the endoscopy suite since, with a finite number of endoscopes, such a significant increase in instrument turnaround time would limit the number of patients per session.

As a consequence we were faced with the need to invest in new containment facilities if we were to continue to use glutaraldehyde. The purchase of new Medivator endoscope washers to replace the existing, ageing machines went some way towards this. The new machines were fitted with appropriate fume extraction, but failed to eliminate all exposure hazards since it remained necessary to handle and pour the

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glutaraldehyde solutions. With new machines in place, however, it became a relatively straightforward task to investigate other sterilant options.

ALTERNATIVES

In looking to change from glutaraldehyde, we examined peracetic acid and the Tristel chlorine dioxide method as alternatives. Peracetic acid was not well received by members of staff, both because of its unpleasant odour and because it appeared to be damaging the endoscopes. Tristel chlorine dioxide offered a number of benefits: a safer alternative to glutaraldehyde; a more effective biocide, which sterilises rather than disinfects; and full compatibility with the Medivator washers.

During the time that we were examining the options we worked closely with the Tristel team members who were keen to develop a range of formats in order to offer a choice of concentration and packaging. The outcome was the installation in September 1999 of a generator, to automatically mix the base and activator solutions and feed the prepared "one-shot" sterilant direct to the Medivator washers. For us this meant the end of mixing, no exposure to hazardous chemicals, no dilution or manual preparation of sterilants and no disposal issues. Our experience and the weight of microbiological evidence in favour of the new method were such that in the endoscopy unit we immediately switched to using the solutions and at the same time stopped using glutaraldehyde.

Since the contact time with the Tristel product is considerably less than that recommended for glutaraldehyde, we were able to improve turnaround time between procedures, ensuring that the number of patients examined is not limited by endoscope availability.

Today, with four endoscopes, we examine an average of 18 patients per three and a half hour session.

SYSTEM

Chlorine dioxide has long been established as a highly effective sterilant, penetrating microbiological structures and acting as an oxidising agent to disrupt metabolic processes. The new system generates chlorine dioxide rapidly and reliably and the incorporation of a patented buffering and inhibition system stabilises the pH close to neutral and protects sensitive materials.

On activation of the sterilant, chlorous acid is produced in solution ($HClO_2$) with the release of chlorine dioxide on contact with the surface of microorganisms. Unlike other chlorine-based products, no free chlorine (a hazardous substance) is produced.

The company can point to an extensive microbiological testing programme conducted at independent laboratories, which was used to establish the minimum level of chlorine dioxide required for sporicidal, tuberculocidal and fungicidal activity. *In vitro* studies have been further validated by in-use testing of the system at the Royal Oldham Hospital.

Toxicology data from a range of studies conducted for the US Food and Drug and Administration demonstrate that Tristel solutions are non-hazardous and non-sensitising. Furthermore, its complete biodegradability is an additional advantage since it can be disposed of to normal drainage and any spills can be managed without the need for special precautions.

Today, almost four years on from our initial experiences, we continue to use the new sterilants throughout Barnet and Chase Farm NHS Trust. The choice of formats now allows the new product use not only in the dedicated endoscopy department at Chase Farm Hospital where most of the endoscopy work is carried out, but also in main theatres where emergency procedures are undertaken, and in a variety of outpatient departments. At Barnet Hospital, the product is now used in the Day Case Unit in theatres and in other departments.

CONFIDENT

We feel confident that the move has not only benefited all those working on the endoscopy teams – the introduction of a sterilant has also enhanced patient safety. Any initial reservations about changing from the well-established glutaraldehyde methods were quickly set aside as the effectiveness of the new solution became apparent and the benefits to operators were rapidly appreciated. +