



Susceptibility of high-risk human papillomavirus type 16 to clinical disinfectants - A critical review

(Meyers et al. (2014). Journal of Antimicrobial Chemotherapy Advance Access)

Abstract

It is well known that the specific lifecycle requirements of human papilloma virus (HPV) are difficult to produce in laboratories, as such no current test method approved by Health Canada, the EPA or FDA exists. Therefore, there are no registered disinfectants on the market with a HPV specific claim. This study is the first to present the first disinfectant susceptibility data on HPV which has created a flurry of questions and concerns around HPV chemical resistance. The intent of this technical bulletin is to address these questions.

The Study

This study tested the susceptibility of HPV, to common clinical disinfectants including ethanol, isopropanol, glutaraldehyde (GTA), ortho-phthalaldehyde (OPA), phenols, peracetic acid-silver (PAA-silver) and hypochlorite. The results of the study indicated that only oxidizing chemistries such as hypochlorite and 1.2% PAA-silver-based disinfectant were able to produce >99.99% reduction in infectivity of HPV. All other disinfectants showed slight or no reduction in infectivity. The main concern arising from this study is the conclusion that HPV is resistant to most disinfectants including sterilants. In order to gain a more realistic indication of disinfectant efficacy against HPV, the study should have included disinfectant chemistries more commonly used for surface disinfection such as Quaternary Ammonium Compounds and Accelerated Hydrogen Peroxide®. A further point of interest is that this study efficacy test method was not equivalent to what a disinfectant manufacturer could submit to Health Canada, the EPA or FDA to achieve such a claim. Unfortunately, the methods and results of this study adds unduly to the perception that HPV possess unusually high resistance to disinfectants.

HPV

HPV is a non-enveloped (more difficult to inactivate versus enveloped viruses) virus from the papillomavirus family that is capable of infecting humans. Like all papillomaviruses, HPVs establish productive infections only in keratinocytes of the skin or mucous membranes. HPV is transmitted primarily via sexual contact; however, concerns regarding potentially infected transvaginal scopes and probes have been an increasing concern. Like HPV, there are a number of pathogens that cannot be cultured in a lab and therefore cannot be tested for efficacy. Generally, regulatory bodies recommend that when testing for efficacy against these kinds of pathogens, surrogate organisms with similar characteristics be used. For example, Human Norovirus, like HPV, cannot be cultured in a lab; however, regulatory

bodies have instead identified Feline Calicivirus (FCV) as the surrogate that has similar qualities to Norovirus. Therefore, if products can prove effectiveness against FCV, a Norovirus efficacy claim can be made. This same concept can be used for HPV however; regulatory bodies have not yet identified an appropriate surrogate as there is **no** Health Canada, EPA or FDA approved test method for HPV. Therefore, disinfectant companies cannot make a HPV efficacy claim on their product labels.

As aforementioned, HPV is a non-enveloped virus, as such are more difficult to inactivate using chemical disinfectants. In trying to determine what product would be considered most effective, we recommend looking for a chemistry that carries a number of claims against non-enveloped viruses such as Poliovirus, Adenovirus, Rhinovirus, Rotavirus and Norovirus, as well as looking at oxidizing-based chemistries that have excellent health and safety profiles.

Conclusions

Although this study appears to have compelling evidence, one must take into consideration the science behind disinfectant claims and what current guidelines allow. Although there are no approved test methods for HPV and no current disinfectants have claims for HPV, it is logical to assume that disinfectants with multiple claims against non-enveloped viruses could be effective against HPV.

Implications for AHP®

Accelerated Hydrogen Peroxide® is an oxidizing-based chemistry with proven effectiveness against a number of non-enveloped viruses. Further, there are AHP® products that can be found for both surface disinfection and disinfection of semi-critical devices such as vaginal probes to prevent the transmission of HPV.

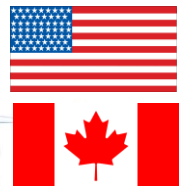
AHP® Surface Disinfectants are One-Step Disinfectant Cleaners

- AHP® has proven cleaning efficiency resulting in lower costs and faster results as well as added confidence that disinfection can occur

AHP® Disinfectants have realistic contact times

- Short contact times ensure surfaces remain wet for the required contact time, providing comfort and confidence that disinfection has occurred

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AHP® Disinfectants provide the perfect balance between safety and efficacy

- AHP® is designed to be easier on employees and occupants resulting in protocol compliance
- The ingredients found in AHP® are all listed on the EPA and Health Canada Inerts lists and the FDA Generally Regarded as Safe List

AHP® Disinfectants are environmentally sustainable

- AHP's® active ingredient, hydrogen peroxide, breaks down into water and oxygen leaving no active residues
- AHP® does not contain Volatile Organic Compounds (VOCs) or other chemicals that will negatively impact indoor air quality

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