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Letter to the Editor

Flash Fire Associated with the Use of Alcohol-Based Antiseptic Agent

To the Editor:

Alcohol-based hand antiseptic agents with emollients, available as foam, gel, and liquid products, are the preferred agents for hand hygiene in many hospitals in the United States and Europe. Advantages of alcohol-based hand hygiene products include broad-spectrum antimicrobial activity with less skin irritation than soap and water.[1,2] One study has found increased healthcare worker (HCW) compliance with hand hygiene when alcohol-based hand hygiene agents are readily available in patient care areas.[3]

Although the flammability of alcohol is well known, alcohol-based products have long been used in the health care setting without incident.[4] We report the case of a flash fire that occurred when a spark of static electricity ignited alcohol hand gel on the palm of a HCW who had just removed a 100% polyester isolation gown.

A HCW obtained a premeasured amount of alcohol hand gel from a bag labeled as containing 70% ethanol from a wall-mounted dispenser. With the gel concealed in the palm of her hand, she removed a 100% polyester isolation gown, placed it on a metal sink and began rubbing gel onto both hands. With hands still damp from unevaporated gel, she pulled on a metal sliding door, generating an audible static spark associated with a flash of light and spontaneous flames on the palm of her right hand. Examination after the incident revealed painful erythema but no blisters. Flames singed the hair on her arms. The episode was witnessed by the mother of a patient.

This represents the first report of a flash fire associated with an alcohol-based hand hygiene agent. The product was subsequently tested by the manufacturer and was found to contain 73.7% ethanol, a concentration higher than stated on the product label but within the manufacturing specifications. Product labeling describes the hand hygiene agent as flammable but not a fire hazard unless used near an open flame. We believe this flash fire was associated with a large discharge of static electricity created when the HCW in rapid sequence applied alcohol gel, removed a polyester gown and touched a metal door. Polyester is a low-moisture fiber that accumulates static charges. Polyester garments such as reusable isolation gowns may produce thousands of volts of electrical charge as surfaces of the gown rub against one another or against garments worn under the gown. Routine activities such as walking across a carpet may generate up to 35,000 volts of electricity. In this case, a charge of at least 3000 volts of electricity must have been generated because the HCW was able to feel a static shock.[5] Rapid discharge of static electricity (electrostatic discharge) of less than 1000 volts can damage sensitive electronic equipment.[6] In this case, electrostatic discharge (ESD) apparently ignited unevaporated alcohol gel.

At present, waterless alcohol-based antiseptics provide many advantages over other hand hygiene agents. Flash fires associated with alcohol-based hand hygiene products and electrostatic discharges are likely to be rare occurrences, although they carry potentially severe consequences for HCWs and their patients. The HCW described here suffered only superficial skin burns. HCWs need education about appropriate use of alcohol-based products, including the need to allow the product to dry or evaporate completely. Attempts to reduce ESD in the health care environment seem prudent. Risk reduction strategies include maintenance of humidification levels within national standards.[7] Additionally, measures to reduce the risk of ESD should be considered wherever alcohol hand hygiene products are used. ESD may be reduced through the use of polyester isolation gowns incorporating an anti-static carbon fiber or through the use of an antistatic finish.

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