

Risk of Bacterial Transmission in Dental Practice

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Every day, bacteria and viruses are passed between people at home, in the workplace and in the community. Given the number of these organisms found in the mouth and nasopharynx and the potential for aerosolization of blood and saliva during dental procedures, it is likely that transmission occurs frequently in this setting. Although few studies have looked at transmission of bacteria in dental practice, indirect evidence that this occurs can be obtained from seroprevalence studies that show that antibodies to a number of viruses found in saliva (such as cytomegalovirus [CMV], influenza virus and respiratory syncytial virus [RSV]) are more common in dentists than in the general population and increase with time from graduation.¹ Carriers of bacteria may be asymptomatic, and transmission to the dental worker and patients can occur if infection control measures, such as use of gloves, masks, protective eye wear and hand hygiene practices are not adhered to.

Bacteria that May Be Transmitted in the Dental Office

Tuberculosis

Mycobacterium tuberculosis, the cause of tuberculosis, is one of the few diseases that is spread via the airborne route. Aerosolized bacteria may remain suspended in the air for long periods of time and inhaled into the lungs of a susceptible person. There have been reports of transmission of tuberculosis in the dental setting.^{2,3} Because masks worn in dental offices are not considered adequate to prevent transmission of tuberculosis, it is important to identify patients at high risk. Patients who are suspected of having tuberculosis should be referred to an appropriate physician for diagnosis and treatment before receiving dental treatment. If emergency dental treatment is necessary for patients with active tuberculosis, they should be referred to a specialized facility with negative pressure and adequate air exchanges. If this is not possible, expert advice should be obtained. In Canada, patients at higher risk are aboriginal people, people from areas of high prevalence, people infected with HIV, the poor and homeless

and drug abusers. Clinical signs that may suggest tuberculosis include chronic cough, fever and weight loss.

Staphylococcus aureus

S. aureus, including methicillin-resistant *S. aureus* (MRSA), is one of the most common causes of both community-acquired and hospital-acquired infections. Recently, strains of these bacteria that are resistant to most antibiotics have become a problem in Canada, particularly in Ontario. These strains are no longer confined to hospitals: Shahin and others⁴ reported spread of this organism to a number of children in a Toronto daycare. Reports of community-acquired cases have also come from the United States.⁵ The nose and mouth are the natural habitat of *S. aureus*, and carriage on dentures has been reported.⁶ Dental workers who become nasally colonized with MRSA may transmit the organism to patients through shedding from their noses or via their hands if infection control practices are inadequate.

Other Bacteria

A number of bacteria may be found in the mouth and throat of people who show no symptoms. Asymptomatic carriers can transmit these bacteria to susceptible people in whom infection can occur. The route of transmission is via droplet spread, which can be prevented by wearing a mask and washing or disinfecting hands. During the winter months, 10 to 20% of all people may be asymptomatic carriers. Bacteria that can be spread in this way include: group A streptococci, *Streptococcus pneumoniae*, *Haemophilus influenzae*, *Neisseria meningitidis*, *Corynebacterium diphtheriae* and *Bordetella pertussis*. These bacteria can cause a wide range of illnesses from pneumonia, to "strep throat" to meningitis. Transmission to other patients and family members, therefore, represents a significant health risk.

Conclusion

Bacteria capable of causing serious disease are present in the mouth and saliva of patients who may show no symptoms.

continued on page 552

with time, and up to 60% of those who initially respond to vaccination lose antibodies within 12 years.⁹ These people may, therefore, receive HBIG unnecessarily.

Are Booster Doses of Hepatitis B Vaccine Necessary?

When the recombinant vaccines were released, initial recommendations included booster doses of vaccine after 5 years due to declining antibody levels. However, studies have shown that even if anti-HBs levels fall below 10 mIU/mL and infection occurs, it is transient and clinically unapparent and chronic disease does not develop. Thus, the National Advisory Committee on Immunization no longer recommends booster doses in immunocompetent people nor periodic testing to determine antibody levels.¹⁰

Conclusion

All nonimmune dental health care workers should receive immunization with recombinant hepatitis B vaccine. Postimmunization serology should be performed to ensure seroconversion and guide further immunization and postexposure prophylaxis. Following seroconversion, booster doses of vaccine are not required. ♦

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The views expressed are those of the author and do not necessarily reflect the opinion or official policies of the Canadian Dental Association.

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*Risk of Bacterial Transmission in Dental Practice
Continued from page 550*

Simple infection control precautions, such as use of gloves and a mask and effective hand hygiene practices, can prevent transmission to dental personnel, their families and their patients. This is particularly important for drug-resistant microorganisms. Prevention of transmission of tuberculosis requires prior recognition of infected or high-risk patients and prompt referral for diagnosis and treatment. Elective dental treatment for patients with active tuberculosis should be delayed until the patient is considered noninfectious. Patients with active tuberculosis who require emergency dental treatment should be referred to an appropriate facility.⁷ ♦

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