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Dental hygiene procedure in a patient with *Giardia lamblia* infection

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Abstract: *Introduction:* Giardiasis, or *Giardia lamblia* infection, is the most common parasitosis of the human digestive tract. It is highly contagious and mostly occurs in warm climates. Children are especially susceptible to infection. *Microbiological Features:* The infection can sporadically occur anywhere and waterborne outbreaks have been reported in some countries. Hence, the prevention of giardiasis depends on proper sanitation. Once ingested through contaminated water, *Giardia* cysts adhere to the intestinal surface. The parasite feeds on the mucous secretions of the intestine and may produce severe infections which can interfere with nutrient absorption. Symptoms in affected individuals usually include diarrhoea, dehydration, stomach cramps, gas, and weight loss. *Diagnosis:* Diagnosis is based on the detection of cysts in fecal samples. Treatment includes the use of metronidazole and other drugs that are effective in clearing the infection within a few days. *Case report:* We report the recent case of a patient with Giardiasis who received dental hygiene procedures and discuss the interventions required in consideration of the patient's concomitant heart condition.

Key words: dental hygiene; full mouth disinfection; giardiasis

Dates:
Accepted 15 February 2007

To cite this article:
Int J Dent Hygiene **5**, 2007; 187–189
Santacroce L, Bottalico L, Mangini F. Dental hygiene procedure in a patient with *Giardia lamblia* infection.

Introduction

The most common flagellated protozoan in the world is *Giardia lamblia*. The prevalence of infection ranges from 2% to 5% in industrialized countries and 20% to 40% in developing countries.

The information available on the epidemiology of such parasitic infections in Italy is not comprehensive. However, Giardiasis is known to account for 2–3% of ill-defined enterogastric condi-

tions in Italy and for a maximum of 8% of such cases in the Region of Campania in Southern Italy. In most cases, affected individuals live in precarious hygienic conditions and the infection may occur concomitantly in members of the same family (1).

Symptoms are not specific and the clinical features can vary greatly. Therefore, suspicion of *Giardia* infection is based on clinical factors as well as epidemiological information (geographical area, immigrants and international travelers) (2).

A number of serologic tests are commercially available for many enteric parasites, but their utility is limited. Commercial kits with immune fluorescent antibodies for the detection of *Giardia* antigens are more sensitive than the traditional microscopic techniques, but they may yield negative results in cases with latent infection. Parasitic cultures for the diagnosis of *Giardia* infection are rarely resorted to and are usually limited to research laboratories because they are time-consuming and expensive.

In most patients, infection is confined to the digestive tube and causes a self-limiting condition with no symptoms. Few patients, usually immunodeficient individuals, may present an invasion of deep tissues with spread of the parasitic cysts into the blood flow and involvement of other organs (brain and heart). In these cases, the infection can determine the functional alterations with organ failure, which may require transplant therapy, as in the reported case (3).

Giardiasis therapy is commonly based on metronidazole administration for 5–7 days with positive results in 80–95% of patients. As single dose of tinidazole, a nitroimidazolic drug, is sometimes used and has proved to be effective in 90–100% of the cases.

Case report

A white (Caucasian) 43-year-old male, born in Lucania and living in Bari, Apulia, Italy was treated as an outpatient at the Dental Hygiene Centre of the University of Bari in June 2006. His past medical history included drug addiction from 1980 to 1993 and a heart condition. The patient was diagnosed as having a heart disorder (not otherwise specified) in 1982 at the Military Health Service. He displayed no evidence of clinical problems until May 2003, when he presented to an Emergency department for unexplained stomach-ache. EKG was performed and revealed tachyarrhythmia (over 300 bpm). The patient was referred to the Cardiology Unit where acute pulmonary oedema and severe heart failure were diagnosed. Treatment with furosemide and mexiletine was immediately initiated leading to complete clinical resolution after 5 days. Some time later, an echocardiogram was performed and revealed the presence of a *Giardia* cyst in the myocardium, in the subvalvular region and left interventricular endocardium. At the same time, the patient had a complete work-up and viral panel testing was negative for HIV and HBV, but positive for HCV, HSV, *Parvo* spp., *Giardia*, *Toxoplasma gondii* infections.

Because of the recurrent arrhythmias, implantation of a defibrillator was performed in October 2003 and medical therapy instituted. The patient was fully compliant with his therapy at all times. In January 2006, a heart transplantation was required because of the patient's severe heart failure. At that point, a full pretransplantation work-up was started, including multiple specialist clinical assessments (ENT, infectious diseases, dentistry, etc.) and relevant treatments, including professional dental hygiene. Dental hygiene care was delivered at the Outpatients' Unit of the Dental Hygiene Center of the University of Bari in June 2006.

Considering the patient's medical history, all necessary preventive measures were taken in the performance of the dental hygiene procedures. Personal protection equipment was used including disposable long-sleeved clinical attire, 'diving-suit', sterile gloves, as well as disposable protection of handles and handpieces. These precautions were taken not only to prevent contagion of the clinician from the patient, but especially also to create the proper antiseptic conditions given the greater susceptibility of the patient to infection. Thus, the therapeutic protocol was started with accurate inspection of the oral cavity, which did not reveal any dental caries. Periodontal probing detected subgingival tartar of some teeth, supragingival tartar was also present. A full mouth disinfection (FMD) protocol was followed:

- brushing of the tongue, teeth and dental arches with a single-use toothbrush;
- double rinse for 30 s with 2% chlorhexidine digluconate for mouth disinfection;
- tonsillar detoxification by spraying a solution of 0.12% chlorhexidine digluconate;
- mixed (manual and ultrasonic) dental scaling associated with manual root planing;
- final polishing with a single use rubber cup and polishing paste; and
- supra- and subgingival applications of 0.1% chlorhexidine gel.

Before being discharged from the hospital, the patient was included in the clinical recall system of the Dental Hygiene Center for routine 6-monthly follow-ups and received a prescription for daily 0.12% chlorhexidine mouthrinses for 10 days

to be followed by 0.05% chlorhexidine rinses for chemical control of the bacterial plaque. The patient was also educated and trained to perform domiciliary oral hygiene manoevres and appropriately motivated to this purpose.

Conclusion

The reported case demonstrates the clinical importance of Giardiasis and the immune-suppressive effects of drug addiction. Such a case highlights the importance of professional oral hygiene in preparing patients for whom a heart transplant has been planned. Regular appointments with the Dental Hygienist are desirable for healthy patients to ensure long-lasting health of the oral cavity, but for patients with a high risk of infection it is mandatory to have optimal, professional oral care. Infection may occur more easily in a heart transplant candidate or recipient than in normal individuals as their immune system may be unable to cope with the infectious agent given their underlying disease or the use of immune suppressive drugs (e.g. azothioprine). The Dental Hygienist is called upon as the health professional who can ensure optimal oral care in these cases. Interventions of oral and dental hygiene can limit the risk of infection by providing non-surgical periodontal care and ensuring the early detection of infectious oral and dental foci that will be treated in collaboration with the dentist.

As reported above, the best protocol for heart transplant candidates consists of FMD, followed by root planing and scaling, and dental sealing as necessary. In addition, daily rinses with 0.12% chlorhexidine for 10 days and thereafter with 0.05% chlorhexidine are essential to provide chemical control of bacterial plaque. Finally, patient education needs to be provided to develop the proper skills for effective and regular performance of home oral hygiene practices.

References

1 Bomfim TC, Huber F, Gomes RS, Alves LL. Natural infection by Giardia sp. and Cryptosporidium sp. in dairy goats, associated with possible risk factors of the studied properties. *Vet Parasitol* 2005; **134:** 9–13.

2 Macpherson CN. Human behaviour and the epidemiology of parasitic zoonoses. *Int J Parasitol* 2005; **35:** 1319–1331.

3 Diaz E, Mondragon J, Ramirez E, Bernal R. Epidemiology and control of intestinal parasites with nitazoxanide in children in Mexico. *Am J Trop Med Hyg* 2003; **68:** 384–385.