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Original Research Article

Do hemophiliacs have a higher risk for dental caries than the general population?

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ABSTRACT

Objective: The aim of this study was to examine if patients with hemophilia were at increased risk for dental decay as compared to the general population.

Materials and methods: Census sampling was used in this case–control study to recruit cases (patients with hemophilia) and a control group individuals recruited randomly from the general population, which were matched with cases based on gender, age and place of residence. Clinical examinations included dental health and salivary assessments (flow rate, buffer capacity, caries-associated bacteria) and a structured questionnaire which inquired about socioeconomic status and dental health-related behaviors.

Results: In the deciduous dentition, the overall caries experience (dmf) differed statistically significantly ($P = 0.003$) between the hemophiliacs (2.6 ± 2.6) and their matched healthy controls (6.1 ± 2.5). Bivariate analyses did not reveal significant differences between cases and controls regarding salivary functions, except that higher bacteriological counts were found in healthy controls in deciduous dentitions than in patients with hemophilia ($P = 0.019$). Children without hemophilia were from higher socioeconomic status families than hemophiliacs ($P = 0.004$), but such differences were not found for adults ($P = 0.090$). When compared to healthy adults, adult hemophiliacs had more gum bleeding at rest ($P < 0.001$) as well as during their tooth brushing ($P = 0.007$) and they also consumed more soft drinks than controls ($P = 0.025$).

Conclusions: Better dental health was observed in children with hemophilia as compared to children without it. There were no differences in dental health between adult hemophiliacs and healthy controls from the general population. None of the linear multiple regression models confirmed hemophilia to be an additional caries risk when it was controlled for other caries determinants.

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1. Introduction

Dental treatments in hemophilia patients are challenging and have inherent health risks that can be life-threatening [1]. Hemophilia is a rare disease linked to males characterized by a defective blood clotting [2] with hemophilia A being the most common type with a prevalence of approximately one per 5000 male births and hemophilia B more rare with a prevalence of approximately one per 50,000 male births [3]. The mild form of either hemophilia A or B may be left undiagnosed until adolescence or even later in life, particularly if a patient did not have surgery, extensive dental work or serious trauma at an earlier age [4]. Given that up to 30% of mild hemophilia cases are first diagnosed following an episode of severe oral bleeding, it is important to increase awareness among dental professionals [5]. Congenital hemorrhagic disorders comprise only a small proportion of general diseases seen in any given population, and possibly this is why there are only a few studies concerning hemophilia and dental disease [6].

A higher severity of overall caries experience was reported among young hemophiliacs who had the severe type of either hemophilia A or B [7]. A higher caries experience in both patients with hemophilia or patients without it is associated with lifestyle factors such as inadequate oral self-care (presence of dental plaque) and sugar-containing diet as well as reduced host resistance. Thus, it is important to know whether patients with hemophilia as compared to the general population are at additional risk for dental decay when controlled for known caries-related determinants. A number of caries-related determinants are well established. Lower socioeconomic status (SES) has been associated with high caries rates in both children and adults [8–10] and explained by a detrimental oral health-related lifestyle such as frequent consumption of sugar-containing foods or drinks, lack of oral hygiene, infrequent dental visits or seeking dental care only when experiencing pain or some kind of problem observed in lower SES groups [11–13]. The frequent consumption of sugar-containing products and deficient oral hygiene are two main etiological factors associated with dental caries [14–16]. Sugar-containing diet and excessive drinking of juices are detrimental to dental health because these increase the acidity of saliva [17]. A deficiency of oral hygiene has also been associated with higher rates of dental decay [18]. Varying results concerning the oral hygiene of hemophiliacs have been reported. A study of Polish children demonstrated that oral hygiene was worse in hemophiliac children than in healthy children [6], while a study by Ziebolz et al. found the reverse was true for adults [19]. Another study focusing on the oral hygiene of children with severe hemophilia found that they had significantly better oral hygiene than healthy children [20]. Proper oral self-care contributes to lower levels of two tooth decay causing bacteria: *Streptococcus mutans* and *Lactobacilli* [21]. Unsurprisingly, the salivary levels of these bacteria were lower in children with hemophilia who had better oral hygiene than healthy controls [20]. The reason why some patients with hemophilia may avoid tooth brushing particularly when they notice gum bleeding [22] is that for some hemophiliacs even minor trauma such as tooth brushing, trauma from eating or infection can cause gingival bleeding [23].

To maintain healthy teeth, saliva is of major importance [24] with saliva buffer capacity and flow rate playing key protective roles against dental caries [25–27]. Saliva buffers acid attacks by resisting drop in pH in the saliva and by also allowing calcium ions to be released from the saliva, which contribute to the remineralization of tooth minerals [17]. On tooth surfaces there is a continuous interchange between the demineralization (loss of hard tooth tissue) resulting from diet and microbial activity and remineralization (repair of hard tissues) from the host defense. When this balance is disrupted, dental caries develop.

Most importantly, in Lithuania general dentists tend not to treat patients with hemophilia due to potential complications. As there are only a few oral pathologists and their offices are located in big cities, access to primary dental care for hemophiliacs is limited. Given these barriers to accessing primary care in Lithuania, we may expect that patients with hemophilia may have higher levels of dental diseases.

The aim of the present study was to examine if hemophilia patients have a higher risk to dental caries than general population.

2. Materials and methods

The study was approved by the Research Ethics Committee, Faculty of Medicine, Vilnius University. The present study included a group of cases (hemophilia patients) and a group of controls. Census sampling (all included) was used for recruiting cases, which were patients 4 years or older listed in a register of hemophilia patients ($N = 76$). The control group ($N = 79$) was chosen from the general population by randomly selecting subjects and matching them with cases based on gender, age and place of residence. To match for gender, only male controls were chosen and to match for age and residence, only males from the specific age groups were randomly selected from five administrative regions of Lithuania. The data for both study groups were collected from November 2011 to March 2013. The present study included a total of 76 registered hemophilia patients (census sampling), of which 27 were children and 49 were adults. The group of matched controls (random sampling) comprised 30 healthy children and 49 healthy adults, both recruited from the general population. The group of cases included a total of 76 hemophilia patients and the group of controls a total of 79 participants. The mean age of participants was 26.1 years (SD 14.4) with the youngest participant being 4 years and the oldest 58 years.

For comprehensive comparison, the following aspects of dental health/disease were considered: overall caries experience, dental treatment experience, unmet dental treatment needs and the presence of functional dentition. All clinical dental assessments were based on 28 permanent teeth (third molars not considered) and on 20 deciduous teeth (full deciduous dentition). One examiner (R.Ž.) assessed dental health or disease in both dentitions employing the WHO Criteria for Oral Health Surveys [28]. The overall caries experience was measured by employing two commonly used indices: the ''DMFT'' measuring the total number of decayed, filled and missing teeth in the permanent dentition and the