

Systemic Organ Changes and Illness can Result from Dental Disease in Dogs and Humans

KEY POINTS

- Periodontal disease, which includes gingivitis, is a common, chronic inflammatory disorder of dogs, cats and humans
- Destruction of tissue around the tooth causes local tissue inflammation and stimulates an immune response
- Bacteria as well as chemicals associated with the immune response may result in systemic changes and disease
- Veterinarians can use this information to better understand the serious role of plaque, gingivitis and periodontal disease in the overall health status of their client's pets

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Introduction

As with other diseases, the normal initial inflammatory response that is meant to be helpful and healing may become detrimental. So is the case when the gingiva around the teeth become inflamed as a result of plaque build-up and the presence of gram-negative periodontal pathogens (bacteria). The bacteria associated with periodontal disease release endotoxins (lipopolysaccharide or LPS) from their cell wall into the local environment of the tooth causing an intense local inflammatory reaction that is first recognized as inflamed, sore gums. Without intervention, this local inflammation often penetrates deeper into surrounding tissues (the periodontium) that function to hold the tooth securely in its bony pocket in the skull. Bacterial endotoxins directly stimulate local immune cells to release inflammatory chemicals (cytokines) that stimulate more local inflammation. However, it is now clear that these local inflammatory chemicals – as well as the bacteria themselves – may reach levels high enough to produce unhealthy systemic effects and even systemic disease.

Summary

Periodontal disease, which can be defined as inflammation of the gingival and other periodontal tissues surrounding the tooth, is not only common and chronic in dogs, cats and people, but is a serious condition that can negatively impact the general well-being of the body as a whole. It is plaque, by definition, that is the root cause of gingivitis and the subsequent development of periodontal disease if left unchecked. In humans, periodontal disease significantly increases the risk of cardiovascular disease, including thromboemboli formation, stroke, endocarditis, as well as premature low birth weight babies, and even pneumonia.¹ The reasons range from a build-up of inflammatory chemicals (cytokines) circulating in the blood, increasing levels of bacterial endotoxins, and the direct effect that some plaque bacteria have on platelets (aggregation). A study looking at histologic lesions in multiple organs from 45 dogs identified a positive correlation between the severity of periodontal disease and the level of tissue changes in the myocardium (heart), renal (kidney) and hepatic (liver) tissues.² Understanding that dental health also effects systemic health can only help to improve the level of dental care and attention that is given to dogs and cats, and can serve as sound reason to emphasize plaque preventative programs both in the clinic and at home.

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References

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2. DeBowes LJ, Mosier D, Logan E, Harvey CE, Lowry S, Richardson DC. Association of Periodontal Disease and Histologic Lesions in Multiple Organs from 45 Dogs. *J Vet Dent*. 1996;13:57-60.

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