If Early Childhood Caries is an Infectious Disease.....Which One?

The recent symposium on prevention sponsored by the American Academy of Pediatric Dentistry in November 2005 left little doubt in anyone's mind that dental caries is an infectious disease. Much recent literature on dental caries has focused on identifying and managing the infectious agents thought responsible for dental caries. As the dental profession looks to eliminate the disease rather than just repair its consequences, the question arises, "If dental caries is an infectious disease, which one is it like?" Eradication of the infectious organisms causing dental caries may be as naïve a goal as restoring dental caries into oblivion, which hasn't worked in over a hundred years.

Epidemiologic, microbiologic, and immunologic clues about the nature of dental caries abound, yet contradictions confound our comprehension of the infectious nature of the disease. Why is there a decline in permanent tooth decay, but a seeming increase in primary tooth decay? How do we explain familial patterns that defy typical transmission principles? Why is fluoride a benefit for some and not for others? It is still not clear which infectious disease model best fits early childhood caries (ECC).

A classic infectious disease to look at first is otitis media. Like ECC, it is a problem in the first few years of life. It too causes pain, lost sleep, and family dysfunction, and, if untreated, has a negative development impact. Ultimately, like ECC, the definitive treatment is surgery, and millions of dollars are spent for repair. Some success in prevention of otitis media has been realized with xylitol and quite a bit is known about its risk factors. Yet, with concerns about antibiotic overuse and a vaccine just on the horizon, millions of children remain afflicted each year, many with recurrent disease.

Almost any infectious disease has its own profile, natural history, and predilections. Recent data from the Centers for Disease Control and Prevention suggest that ECC is inextricably tied to poverty with continuing failure of active or passive dental prevention to penetrate the poverty and color lines of ECC in this country. Maybe ECC is like tuberculosis (TB) in its pervasiveness in the poor and crowded? People in places like Haiti and other third-world impoverished countries suffer disproportionately from TB, so maybe the model fits. Maybe ECC is like AIDS, which knows no socioeconomic boundaries, but tends to move like wildfire through those populations lacking awareness. Like AIDS, ECC is closely aligned with lifestyle, culture, and ethnicity. Despite its lethality, it continues to spread. ECC can be found in all economic classes and its continued transmission, particularly in the poor and ethnic minorities, and can be tied to cultural and ethnic behaviors—diets high in carbohydrates and a view by many cultures that dental care is only reparative, not preventive. With ECC, we see a growing acceptance of the condition, even with its irreversibility, because it can be controlled and treated. The cultural and socioeconomic patterns of AIDS and the difficulty of penetrating susceptible groups with a preventive message sound a lot like our frustration with eliminating ECC in many subpopulations.

Truth be told, ECC is its own disease. It is a disease of childhood, the poor and underserved, and the uninformed. Like many infectious diseases, ECC has significant economic consequences. It is tied closely to social, economic, and cultural roots. It has no cure and can plague a child into adulthood, as an active disease and with its irreversible consequences. And we have no idea how to stop it.

The purpose of this editorial isn't to propose an infectious disease model for ECC, but to warn us against being seduced into believing that its elimination is as simple as a drug or vaccine. ECC, like many other infectious diseases, has deep roots in a child's developmental status, health, cultural and ethnic behaviors, and lifestyle. We should not be so sure that even if an effective medical solution is developed, it would mean the end of ECC. Until we can address many of the same issues that keep other more serious infectious diseases alive and well in humanity, we will continue to see ECC.

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