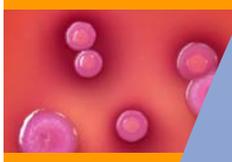




▶ Children and Adolescents with Diabetes: They are not Simply "Little Adults"



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From Your Dentistry for Diabetics (DFD) Professional
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Informed

The truth about the diabetic & oral care

Oral Health for Adolescents How Important is it?

In this issue of *Informed* newsletter will focus on children, adolescents and young adults with diabetes.

If you are a practitioner treating pediatric patients with diabetes, you understand at a deep level the added complexity associated with screening, treatment and management of juvenile patients (complexities brought on by developmental and physiological immaturity). You know that treatment options and management goals can differ markedly. In the following pages, we will examine the impact childhood diabetes has on oral health — more specifically how

metabolic control affects gingival inflammation and periodontal infection. We will also review research surrounding bidirectional relationship between oral disease and diabetes. Lastly, we will examine oral testing and treatment options that may positively impact glycemic state and systemic health of pediatric patients.



Did You Know?

Extensive evidence indicates that near normalization of blood glucose levels is seldom attainable in children and adolescents after the honeymoon (remission) period.

Children and Adolescents with Diabetes: They Aren't Simply Small Adults

As the American Diabetes Association states, when considering diagnosis, management and treatment for patients under the age of 18, “children are not simply small adults”. Children and adolescents with type 1 diabetes differ markedly from adult patients in symptoms, physiological and cognitive maturity, as well as disease onset. Insulin sensitivity related to sexual maturity, physical growth, ability to provide self-care, and a unique neurologic vulnerability to hypoglycemia all affect treatment options.¹

A1C level achieved in the “intensive” adolescent cohort of the DCCT group was 1% higher than that achieved for older patients and current ADA recommendations for patients in general

“hypoglycemic UNawareness” in which the body does not respond to changes in glycemic levels. Couple that with the child’s lack of cognitive ability to identify his or her own hypoglycemic symptoms and to self-manage, and these patients can be at grave risk for hypoglycemia and associated comorbidity.

As proof of this predisposition in childhood type 1 diabetes toward hypoglycemia, the American Diabetes Association in its

Standards of Medical Care 2007 reported that A1C levels achieved in the “intensive” adolescent cohort of the DCCT group was 1% higher than that achieved for older patients and current ADA recommendations for patients in general.²

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How and Why that Applies to Oral Health

According to the American Medical Associations Standards of Medical Care referenced above, the care of children and adolescents with type 1 diabetes should be provided by a multidisciplinary team of specialists trained in the care of children with pediatric diabetes. The reason for such a statement is that cognitive and physical development in children adds many levels of complexity to a disease that is already difficult to treat and manage. Therefore, specialized care in the various, potential sequelae is key to providing ongoing screening, treatment and counseling needed to support young patients to optimum possible health. Of concern to this publication and those responsible

diabetic care for pediatric patients, however, is the reciprocal affect between glycemic control and poor oral health. Studies have shown that patients under the age of 18 with diabetes have twice as many sites showing gingival inflammation, compared to non-diabetic control groups. Further, poor metabolic control may increase severity of gingival inflammation.^{3,4}

Risks of Non-treatment

If not treated to reduce inflammation and microbial populations, gingivitis can lead to infection of the periodontium.



Periodontitis is a local inflammatory process mediating destruction of periodontal tissues — triggered by bacterial insult. However, this disease is also characterized by systemic inflammatory host responses that may contribute, in part, to the higher risk for cardiovascular disease (CVD) among patients with periodontitis.

In a study published in the Journal of the American Dental Association, 263 type 1 diabetic patients under the age of 18 were examined for periodontitis. Periodontitis was not found in any subjects under the age of 12. However, by the age of 13 to 18, 13.6% of patients were observed with periodontal disease versus <3% in the control group. Further, the incidence increased to 39% between the ages of 19 - 32 while the control group maintained a rate of less than 3%.

This data highlights the importance of treating both oral infection and glycemic control – because each affects the other in negative fashion. Gingival inflammation and periodontal infection can drive glycemic levels out of target ranges, while poorly managed glucose levels impact the system’s ability to fight off infection.

Perhaps just as troubling as ongoing inflammation and infection are the effects of periodontal disease, as it advances. Advanced periodontitis can lead to alveolar bone loss and tooth loss -- adding to dietary

and nutritional challenges, while also affecting adolescent self-image and emotional wellbeing.

In Sum

Childhood diabetes is multifaceted and challenging disease to treat. Cognitive and physical immaturity further complicate an already complex, systemic disease. Oral health is yet another aspect of childhood diabetic care that those who treat the pediatric population need to understand and address. Seeking the support of oral health professionals specifically trained in diabetic dental care is of the utmost importance in early prevention and treatment of gingival and periodontal diseases.

1. Standards of Medical Care in Diabetes; American Diabetes Association, *Diabetes Care*, 2007; 30: S24-S26.
2. American Diabetes Association: Standards of medical care in diabetes (Position Statement). *Diabetes Care* 28:S4–S36, 2005
3. de Pommereau V, Dargent-Pare C, Robert JJ, Brion M. Periodontal status in insulin-dependent diabetic adolescents. *J Clin Periodontol* 1992;19:628-6
4. Gusberti F, Syed S, Bacon G, Grossman N, Loesche W. Puberty gingivitis in insulin-dependent diabetic children. I. Cross-sectional observations. *J Periodontol* 1983;54:714-720.

Periodontitis: Pathogen or Predictor?

Past issues of *Informed* have taken up the discussion of how and to what degree periodontal disease affects the pathophysiology and systemic health of diabetic patients. For example, is the increased incidence of cardiovascular co morbidity in diabetics with periodontitis caused by perio pathogens that have developed virulence factors, or does periodontitis create an ongoing inflammatory burden at the system level that weakens vascular, retinal, nephropathic and neuropathic systems? Or is periodontitis, as some researchers contend, purely a marker for inflammation and increased serum levels.

Gum Disease May be Your Ally

What is interesting is that, in the case of adolescents, gum disease may actually be an ally to practitioners and caregivers in diagnosing and monitoring childhood diabetes.

Type 1 diabetes is among a relative few childhood disorders that predispose children to periodontal disease. Others are Down syndrome and Papillon-Lefevre syndrome.

Mild gingival inflammation is fairly common among children and adolescents, due to their immature oral hygiene habits. Advanced forms of periodontal disease are not, however. Type 1 diabetes is among a relative few childhood disorders that predispose children to periodontal disease (others are Down syndrome and Papillon-Lefevre

Check it Out

Studies have shown that increased frequency of use of basal bolus regimens (including insulin pumps) in youth from infancy through adolescence has been associated with more children reaching ADA blood glucose targets.

syndrome). Therefore pediatric patients displaying increased periodontal infection are candidates for diabetes types 1 and 2 and should be cared for both by a physician and dentist trained in their proper care.

What You Can Do

Medical doctors with pediatric patients at risk for developing diabetes should refer the patient to a diabetic care dentist. Under the care of a DentistryForDiabetes dentist, the patient will be

treated regularly for inflammation and infection of perio tissue and dental carries. In addition, his A1C levels will be tested with each visit. The result may be early diagnosis and treatment to prevent advanced oral as well as system wide complications.

Pediatric dentists, who have diagnosed patients with advancing perio disease, should refer these patients to both a diabetic care physician as well as a DentistryForDiabetes dentist for optimal care.

What's Clicking? Plasma Blood Glucose Goals for Infants, Children, & Adolescents

In keeping with the theme of this newsletter, the *What's Clicking* segment this month consists of the position statement from the American Diabetes Association on plasma glucose and A1C goals for children — ages 0-19.

Noteworthy Concepts

Noteworthy ideas and concepts from this position statement include the following.

1. Goals should be individualized and lower goals may be reasonable based on benefit-risk assessment.
2. Blood glucose goals should be higher than those listed above in children with frequent hypoglycemia or hypoglycemia unawareness.
3. Postprandial blood glucose values should be measured when there is a disparity between preprandial blood glucose values and A1C levels.

Plasma blood glucose and A1C goals for type 1 diabetes by age-group

(Taken from Standards of Medical Care 2007; American Diabetes Association, *Diabetes Care*, 2007. 30:S5.)

Value by age (years)	Plasma blood glucose Goal range (mg/dl)		A1C	Rationale
	Before Meals	Bedtime / Overnight		
Toddlers and pre-schoolers (0–6)	100-180	110-120	8.5% (but > 7.5%)	High risk and vulnerability to hypoglycemia
School age (6–12)	90-180	100-180	8.0%	Risks of hypoglycemia & relatively low risk of complications prior to puberty
Adolescents and young adults (13–19)	90–130	90–150	7.5%	<ul style="list-style-type: none"> •Risk of severe hypoglycemia •Developmental and psychological issues •A lower goal (7.0%) is reasonable if it can be achieved without excessive hypoglycemia

From:

To: