2023 ANNUAL CONFERENCE
PESTOLA
PEDIATRIC ENDOCRINE SOCIETY
OF TEXAS, OKLAHOMA, LOUISIANA, AND ARKANSAS
FEBRUARY 3-5 | THE SKIRVIN HILTON
OKLAHOMA CITY, OK
A HYBRID EVENT

Polyglandular Autoimmunity: Two Cases of Type 1 diabetes (T1D) accompanied by Addison's disease (AD)

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Introduction

- T1D, present in ~1:500 children, is often accompanied by other autoimmune conditions, notably chronic lymphocytic thyroiditis. Involvement of other endocrine organs, however, is rare.
- Autoimmune impairment of more than one endocrine system is referred to as an autoimmune polyglandular syndrome (APS), categorized as type 1 (APS-1) or type 2 (APS-2). In addition to T1D, APS-1 is characterized by 1 or more of the following: candidiasis, hypoparathyroidism and/or AD; while APS-2 involves AD and/or chronic thyroiditis[2].
- The lifetime risk of developing a 2nd endocrine autoimmune condition in individuals with T1D is ~1:5, and usually occurs during adulthood. While children may be affected, such reports are unusual and generally limited to case studies.
- APS-2 is rare in childhood, with a prevalence of ~ 1:100,000[4].
- We present two children with APS-2.

Case 1

- A 6-year-old Caucasian male, previously diagnosed with T1D at 3 years-of-age, presented with persistent vomiting and dehydration.
- Although prior to hospitalization his diabetes was reasonably well controlled, the child was noted to be overly sensitive to insulin during this admission. Despite adequate food intake, he experienced several episodes of hypoglycemia with age-appropriate insulin therapy.
- Laboratory testing revealed metabolic acidosis, hyponatremia, and low levels of cortisol during episodes of hypoglycemia.
- Diagnostic testing confirmed primary adrenal insufficiency; the latter, along with his T1D, being consistent with APS-2.

Case 2

- A 15-year-old Caucasian male experienced an unexplained 20 lb. weight loss.
- After developing fever, routine laboratory tests were found to be consistent with diabetic ketoacidosis (DKA) - hyponatremia, metabolic acidosis and hyperglycemia.
- With treatment, his DKA resolved, and he began conventional insulin therapy. However, follow-up laboratory tests demonstrated persistent hyponatremia.
- Additional studies confirmed the presence of AD, consistent with APS-2.

Discussion

- These previously healthy children developed T1D accompanied by AD, characteristic of APS-2.
- The presence of both conditions significantly increases the risk of potential life-threatening complications in affected children[5]. Individuals with both T1D and AD have a 2.5-fold increased risk of adrenal crises, compared to those with isolated AD[6]. Timely diagnosis of polyglandular autoimmunity is critical to help inform clinical decision-making, and to avoid adverse outcomes.
- The diagnosis of APS is often hampered by common symptoms such as: fatigue and weakness, unexplained weight loss, increased thirst, frequent urination, irritability, nausea and abdominal pain, and changes in appetite[1].
- Management is complicated by the effects of glucocorticoid levels on insulin sensitivity. For example, these patients have a risk of increased insulin sensitivity and hypoglycemia in the early morning hours prior to the next glucocorticoid dose[1]. Patient education is key for understanding the interactions between the two conditions as well as the effects of diet, physical activity, and emotional stress[3].
- While the onset of APS is variable, most patients tend to develop autoimmunity sequentially over a period of many years[2]. APS-2 has been linked primarily to genes coding for major histocompatibility complex, particularly DR3-DQ2 and DR4-DQ8 variants[6].

Conclusion

- The occurrence of more than one endocrine autoimmune-related condition in an individual is uncommon but can occur.
- Signs and symptoms associated with autoimmune induced organ system failure can often overlap and complicate both diagnosis and management[2].
- Physicians should be vigilant in assessing children with autoimmune-related conditions, such as T1D, and although rare, aware of the potential for additional autoimmune-mediated organ failure in some.
- Unexplained weight loss, hypoglycemia, nausea/vomiting, and hyperpigmentation in children with T1D are often clues to additional organ involvement[3].

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