

EFFECTS OF DIABETES ON SPEECH AND LANGUAGE ACROSS THE LIFESPAN

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Abstract

According to the CDC, “diabetes is a chronic health condition that affects the way your body turns food into energy”. More than 37 million adults in the United States have diabetes which is the seventh leading cause of death in the United States. With diabetes affecting such a large portion of the population, what do speech-language pathologists need to know about how blood sugar affects speech and language in various types of individuals? This literature review explores the effects of language development later in the life of babies born to mothers with diabetes. The effects that diabetes has on adults’ ability to process language will also be identified. The roles of speech-language pathologists in the care of diabetic patients will be explored, and learners will be provided with information about how to best provide care for their diabetic patients. Speech-language pathologists play a vital role in helping their clients affected by diabetes across the lifespan with expressive and receptive language.

Learning outcomes:

At the end of this presentation, participants will be able to:

1. Explain the effects that diabetes has on newborns' speech and language development.
2. Explain the effects that diabetes has on adults' ability to process language.
3. List 3 takeaways that speech-language pathologists need to know in order to better treat their diabetic patients.

Introduction

Diabetes is defined as “a chronic health condition that affects how your body turns food into energy.” According to the CDC, more than 37 million adults have diabetes, and 1 in 5 adults have diabetes but do not know that they have it. Diabetes is the seventh leading cause of death in the United States and the number one cause of kidney failure, lower-limb amputations, and adult blindness.

Types of diabetes	Description	Prevalence
Type 1	The body stops producing insulin.	5-10% of those with diabetes have type 1.
Type 2	The body produces insulin but does not know how to properly use it.	90-95% of those with diabetes have type 2.
Gestational	Diabetes in women who did not have diabetes prior to their pregnancy.	2-10% of those pregnant develop gestational diabetes.

Methods

In order to answer the research question, of what effects diabetes has on newborns’ speech and language development and adults’ ability to process language, a literature review was conducted. Most studies gathered were meta-analyses, experiments, case studies, and one longitudinal study.

Findings

Adults:

- Research has found that hyperglycemia can affect executive functioning as well as lead to temporary expressive aphasia that will resolve itself. It is recommended that diabetic patients with abrupt aphasia should have their blood sugar levels examined to confirm the diagnosis, and appropriate management should then be determined.
- Working memory: In one study, The National Adult Reading Test (NART) was administered to participants to determine their intellectual baseline, the results showed that Hypoglycemia caused a significant decrease in reading span; however, hypoglycemia did not affect the number of errors in sentence comprehension, or the time taken to answer questions.

Children:

- Children with diabetes show a trend of decreased language abilities across receptive, expressive, and general language skills.
- When looking at cognitive function, children with type 1 diabetes performed similarly to non-diabetic children but children with unmanaged diabetes showed lower cognitive abilities.
- When you exclude high-risk factors such as children born to mothers with gestational comorbidities, obesity, and low socio-economic status, maternal diabetes has a limited effect on children’s language abilities.
- A study out of Quebec used the McArthur Communicative Development Inventory, Peabody Picture Vocabulary, and the Early Development Instrument at different ages in the child’s life. The results showed that infants of diabetic mothers scored 0.27 to 0.41 standard deviations lower than children born to non-diabetic mothers.

Level Names	Categorization	Blood sugar levels (mg/dL)
Hypoglycemia	Low blood sugar/ low glucose	>70mg/dL
Hyperglycemia	High blood sugar/ high glucose	<125mg/dL and < 180mg/dL

Clinical Implications

- 37 million adults have diabetes, so the chances of having a diabetic patient on our caseload are high. Just like the rest of a patient’s medical history, it is important to consider a patient’s diabetes diagnosis.
- Diabetes can play a negative role in language development in children and language processing in adults. Unmanaged diabetes can affect a patient’s working memory.
- If left unmanaged, diabetes can affect language to the point where it will resemble aphasia.
- Maternal diabetes does not solely play a role in delayed language development. But like adults, children with diabetes show a trend of decreased receptive and expressive language and lower cognitive abilities.
- Before assessing a patient’s language abilities, SLP’s should ensure the patient’s glucose levels are within functional limits - increased or decreased blood sugar levels can play a role in a patient’s language assessment results.

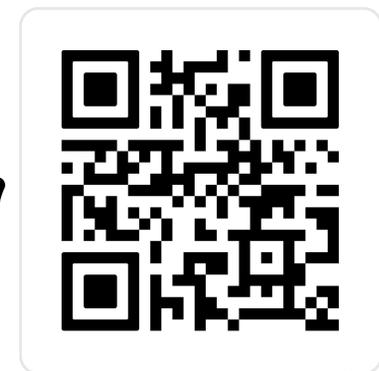
Conclusion

Unmanaged diabetes (all types) in adults can lead to deficits in cognition and deficits in the brain’s language center. Temporary aphasia was observed in a patient with hyperglycemia.

Research has found that there is little effect on newborns’ speech and language development for babies born to mothers with gestational diabetes. However, similar to adults, unmanaged diabetes in children has a negative effect on school-age children’s cognitive and speech, and language development.

Patients should be sure to manage their diabetes properly. Speech-language pathologists should take into consideration their patients’ blood sugar levels and history of diabetes when assessing their cognitive and language functions.

References



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