

A Study of Secondary Bacterial Infections in Diabetes Mellitus Type 1:

Dr Ananth Pai

Assistant Professor, Department of Pediatrics, Yenepoya Medical College, Mangalore

Abstract: *Background:* Diabetes Mellitus type 1 is commonly seen in pediatric age group. The genetic and hereditary background plays a very important role in the disease. Evidence from clinical studies to understand the relations between diabetes and immune – compression is not conclusive. The reason for this include incompletely defined abnormalities in cell mediated immunity and phagocyte function associated with hyperglycemia and also less vascular perfusion of the tissues. Diabetes mellitus is associated with increased rates of infections. Diabetic patients have more frequency and severity of infections. High serum glucose levels aid the colonization and also growth of a variety of organisms. With this background there is a need to study and understand the secondary bacterial infections seen frequently in Diabetes Mellitus.

Keywords: Diabetes Mellitus, Infections, Immunity, Fungal, Bacterial

1. Introduction

Diabetes Mellitus type 1 is commonly seen in pediatric age group. The genetic and hereditary background plays a very important role in the disease. Evidence from clinical studies to understand the relations between diabetes and immune – compression is not conclusive. The reason for this include incompletely defined abnormalities in cell mediated immunity and phagocyte function associated with hyperglycemia and also less vascular perfusion of the tissues. Diabetes mellitus is associated with increased rates of infections. Diabetic patients have more frequency and severity of infections. High serum glucose levels aid the colonization and also growth of a variety of organisms. Diabetes mellitus has been associated with increased rates of infections^{1,2,3}. Impairment of cell mediated immunity is the chief cause. Respiratory infections, urinary tract infections, Gastro Intestinal tract infections and skin infections are quiet common.

With this background there is a need to study and understand the secondary bacterial infections seen frequently in Diabetes Mellitus.

2. Aims and Objectives

To study and understand the infection pattern in Diabetes Mellitus Type 1.

3. Materials and Methods

Sixty twenty patients who were freshly diagnosed diabetics were included in the study. The study was done in the Department of Pediatrics, Yenepoya Medical College, Mangalore.

The study was done from November 2012 to July 2015.

Detailed history was taken and prompt immediate treatment for diabetes was started. These patients were followed and the commonly encountered infections were noted for the study period.

Symptoms of the infection was found and noted. Swabs were taken and sent to the Department of Microbiology to find out the positive culture.

All the statistics were done using latest SPSS software 2015, California.

4. Results

Table 1: Mean age of the study population.

	Mean	Std. Deviation
Age	4.24	2.34

Table 2: Frequency of symptoms of different diseases

Symptoms of the disease	Total
upper respiratory tract infection	15
Lower respiratory tract infection	24
Urinary Tract Infection	06
Bacterial skin and mucous membrane infection;	11
Mycotic skin and mucous membrane infection	04

Table 3: Test for significance

Infections	Culture Positivity		p value
	Present	Absent	
upper respiratory tract infection	2	13	0.030
Lower respiratory tract infection	1	23	
Urinary Tract Infection	2	4	
Bacterial skin and mucous membrane infection;	3	7	
Mycotic skin and mucous membrane infection	3	1	

There is a strong association of the infections in the diabetic mellitus patients. (P<0.05)

5. Discussion

Diabetes Mellitus patients as discussed earlier are at increased risk for developing common infections. In this study were able to study associations of diabetes with common infections involving different organ systems. Statistically significant associations were found out between the incidence of infections and diabetes mellitus Type 1.

Evidence from clinical studies for a causal relation between diabetes and common infections is, however, limited and not consistent^{4,5,6}. The reason for these infections is the decreased immunity in the human body. The reason for this include incompletely defined abnormalities in cell mediated immunity and phagocyte function associated with hyperglycemia and also less vascular perfusion of the tissues. Fungal infections like candida are more commonly seen in the patients who are suffering from persistent hyperglycemia^{7,8}.

Many aspects of immunity are altered and diseased in patients with diabetes mellitus. Leukocyte particularly Polymorphonuclear types function is depressed and acidosis is also present this doubles the effects. Its chemotaxis, adherence and phagocytosis will be affected. Antioxidant systems involved in bactericidal activity will be pathologically impaired. The study to support humoral immunity pathogenicity is limited, but responses to vaccines appear to be normal. Skin responses to antigen prick test challenges and measures of T-cell function may be depressed.

6. Conclusion

Diabetes Mellitus depresses the immunity and causes a plethora of infections. This study helps the practicing pediatricians to understand the common secondary infections and thus help them in their daily practice

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