

**Infection Precipitated Type II Diabetes Mellitus- Case Report**Dr. Meena Priya. S<sup>1\*</sup>, Dr. Shyam sundar.S<sup>1</sup>, Dr. B. Shanthi<sup>2</sup>, Dr. Kalai Selvi<sup>3</sup>, Dr. A.J. Manjula Devi<sup>3</sup>,<sup>1</sup>Tutor, Dept. of Biochemistry, Sree Balaji Medical College and Hospital, Chromepet<sup>2</sup>Professor and H.O.D Dept. of Biochemistry, Sree Balaji Medical College and Hospital, Chromepet<sup>3</sup>Professor Dept. of Biochemistry, Sree Balaji Medical College and Hospital, Chromepet**\*Corresponding author**

Dr. Meena Priya. S

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**Abstract:** cellulitis is common bacterial infection, seen mostly in immunosuppressant individuals. Legs are the most common site of cellulitis and also associated with enlargement of regional lymphnodes. Cellulitis is usually associated with uncontrolled hyperglycemia, commonly in patients with diabetes mellitus type 2. The diagnosis is made with series of blood test like completed blood count, total leukocyte count, differential count and blood culture. The preliminary treatment is with antibiotics and controls of the underlying causes of cellulitis mainly the blood sugar levels with anti diabetic medications.

**Keywords:** bacterial infection, hyperglycemia, antibiotics, anti diabetic medications

**INTRODUCTION**

Cellulitis is a bacterial infection involving skin and tissues mainly dermis and subcutaneous fat. The term is usually used to indicate the non necrotizing inflammation of the skin and subcutaneous tissue mainly caused by staphylococcus, streptococcus [1]. The cellulitis can occur in any part of the body but mainly involved are face and legs. The cardinal signs are erythema, pain, swelling, warmth. It is occasionally associated with inflammation of regional lymph nodes. The blood tests done are usually blood cultures, complete blood count, creatinine, bicarbonate, creatine phosphokinase, C-reactive protein. Ultrasonography is done to differentiate mainly from abscess [4].

The treatment mainly includes the antibiotics and drainage if abscess is present. Type II diabetes mellitus is a metabolic condition which is mainly characterized by hyperglycemia, insulin resistance and lack of insulin relatively. The most common symptoms are increased thirst, frequent urination, increased hunger, unexplained weight loss, fatigue. It is more common in obese and hypertensive patients. The investigations done are fasting and post prandial blood glucose levels, oral glucose tolerance test, glycated haemoglobin. The management includes life style modifications, anti diabetic medications, insulin therapy, surgery for obese patients.

**CASE REPORT**

A 55 years old male was admitted with complain of pain and swelling over the dorsum of left foot since 12 days, while fever since 7 days. There is h/o trauma 12 days back. He is known case of Type II Diabetes mellitus since 1 week, not on any medications. On General examination he was conscious, oriented and co-operative, febrile, Vitals are normal. On local examination swelling present in left foot, skin maceration, serous discharge, tenderness, warmth are present. His blood sample was taken and sent for biochemical analysis where random blood glucose

level, urea and creatinine found to be very high [2]. The electrolytes such as sodium, potassium, chloride levels were low. On urine routine examination, albumin and sugar positive.

**LAB INVESTIGATIONS**

CBC : Haemoglobin- 11.5gm% , TLC-14900, P-90% L6% E-5%, RBC -4.56 million, MCV- 85.4 fl, MCH- 27.2pg, MCHC- 31.98, Platelet – 229000

RFT: Urea – 51mg%, Creatinine – 1mg% on the day of admission.

Urea- 38 mg%, Creatinine- 0.6 mg% -after 3 days of admission.

Urea- 22mg%, Creatinine- 0.4 mg% -after 5 days of admission.

Electrolytes: Na+- 116.7mEq/L, K+- 2.96mEq/L, Cl<sup>-</sup> - 80.7 mEq/L - on the day of admission.

Na+- 125.6mEq/L, K+- 2.94mEq/L, Cl<sup>-</sup> - 94.2 mEq/L – after 3 days of admission.

Na+- 128mEq/L, K+- 5.3mEq/L, Cl<sup>-</sup> - 96.8 mEq/L – after 5 days of admission.

Blood sugar – RBS- 603mg/dl

FBS-160 mg/dl after 5 days of admission

PPBS-166mg/dl after 5 days of admission

Urine routine: Protein-2+, RBC nil, Albumin +, Sugar4+,  
24 hour urine protein- 364mg

### Serology

HIV- non reactive  
HBSAg- negative.

### TREATMENT

- The first step is to treat with antibiotics. Antibiotics recommended are cephalosporins (ceftriaxone), amoxicillin, doxycycline, erythromycin.(2,3)
- Hyperglycemia should be controlled by administration of anti diabetic medications such as metformin, glibenclamide, glimepride. If the glycemic control is poor, insulin therapy is given.
- Monitoring of blood glucose levels is done and excretion of sugar in urine is checked.
- Glycosylated haemoglobin-HbA1C level is checked for the analyzing the control of blood sugar level for past 3 months.
- Monitoring of kidney function, by serial serum creatinine measurements and monitoring of urine output, is routinely performed.
- Patients with sudden increase in blood glucose levels generally should be hospitalized unless the condition is mild and clearly resulting from an easily reversible cause. The key to management is assuring adequate blood glucose levels, renal perfusion by achieving and maintaining hemodynamic stability and avoiding hyperosmolarity.
- Ampicillin or Vancomycin can be combined with an aminoglycoside.
- Adequate fluids atleast 8oz. glasses per day.
- Follow up blood glucose levels, electrolytes, urine examination is indicated.

### DISCUSSION

Diabetes mellitus is mainly characterised by insulin resistance and abnormal insulin secretion due to non responsive peripheral receptors. Diabetes mellitus is the most common endocrine disorder occurring in the world. Type II diabetes patients are more prone to develop associated skin lesions and infections whereas the Type I diabetes patients are associated with autoimmune type cutaneous skin lesions. Type 2 DM patients have high predilection to develop Hyperosmolar Hyperglycaemic State (HHS) [7-9]. There will be history of polyuria, weight loss. On examination there will be profound dehydration, hyperosmolality and reveals hypotension, tachycardia,

and altered mental status. The characteristics of DKA such as nausea, vomiting, abdominal pain and kussmaul respirations will be absent. HHS is precipitated often by a serious concurrent illness such as stroke or myocardial infarction. The precipitants such as sepsis, pneumonia, and other serious infections are mainly to be diagnosed and to be treated. The underlying cause of HHS is relative insulin deficiency and inadequate fluid intake.

In our case report we have established the causal relationship of cellulitis as an instigating factor for the precipitation of non ketotic hyperosmolar hyperglycemia in a previously newly diagnosed diabetes mellitus.

Cellulitis is more common in people with diabetes and can spread rapidly as there is high blood glucose. In non-diabetic individuals the high glucose if present, insulin plays a role in maintenance and is also released to help fight the infection as immune response. Cellulitis is mainly an infection of the skin and the underlying tissues of the skin. It is mainly caused by bacteria such as staphylococcus, streptococcus, methicillin resistant staphylococcus aureus (MRSA) [5]. Infection by rare organisms and at rare unusual areas can occur more commonly in diabetes people and if not treated at the correct time there are high chances of morbidity and mortality. Studies have shown that diabetes mellitus is also a risk factor for Salmonella enteritidis [6, 3] infection [6]. This cellulitis can also lead to necrosis of muscle and fascia associated with gangrene in skin and subcutaneous fat in patients with uncontrolled diabetes mellitus resulting in necrotizing cellulitis.

### CONCLUSION

Diabetes mellitus is one of the most common diseases found in India. Patients with diabetes mellitus are prone to many secondary infections such as cellulitis, fungal infections, tuberculosis, gangrene, and necrotising fasciitis. In patients with type 2DM, the most serious acute emergency condition is Hyperosmolar Hyperglycemic State (HHS). The reduced blood flow results in vascular problems due to untreated diabetes. Cellulitis is a condition which can occur in patients with compromised immune system such as diabetes mellitus. Untreated cellulitis can lead to sepsis causing death. Thus cellulitis is a treatable condition and antibiotics are the only therapy indicated and to prevent spread of infection. HHS should be closely monitored with fluid and insulin therapy.

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