

Diabetes & its Complications

Neglected Type 1 Diabetes Presenting With Chronic Malnutrition in a Vagrant Teenager

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ABSTRACT

Background: The incidence of type 1 Diabetes Mellitus (DM) in children is increasing globally on yearly basis and lack of access to insulin remains the most common cause of death.

Case report: We present a 12-year-old prepubertal female vagrant who was brought for medical attention by Ekiti State Government officials. She presented with 4-year history of polyuria, polyphagia, weight loss and secondary enuresis. She was chronically ill looking, very weak, had a very low weight of 21kg (< 5th percentile), a low-normal height of 140cm (between 10th and 5th percentile). An assessment of Type 1 diabetes mellitus with chronic malnutrition was made. The random blood glucose (RBG) at presentation was unrecordably high and had glycosuria. The patient was resuscitated with normal saline for the first 2 hours after which insulin infusion was commenced at 0.1IU/kg/hour and later subcutaneous insulin. She made remarkable improvement before discharge to the Government transition home.

Conclusion: Chronic malnutrition is an uncommon presentation of type 1 DM in adolescents. Poverty and family conflict was a contributing factor to patient's chronic malnutrition and vagrancy. Public-private partnership and multidisciplinary approaches are vital for effective management of DM among children and adolescents in developing countries.

Keywords

Type 1 Diabetes mellitus, Chronic malnutrition, Vagrant, Teenager.

and bedwetting [4,5]. We present an uncommon case of type 1DM in a vagrant teenager with chronic malnutrition.

Introduction

Type 1 Diabetes mellitus (DM) is the most common type of DM in children and adolescents and the incidence of type 1 childhood DM has been increasing globally on yearly basis [1]. Lack of access to insulin is the most common cause of death in childhood diabetes worldwide and this is worse in poverty-stricken developing countries where health care financing is mostly out-of-pocket [2]. Diabetic Ketoacidosis (DKA) is the most common presentation of childhood diabetes mellitus [3,4]. Few patients in developing countries present for the first time with polyuria, polydipsia, polyphagia, weight loss

Patients and Case report

The patient was a 12-year-old female who was brought to the children emergency room by government officials after being picked up at a motor park in Ado- Ekiti, South-West Nigeria when noticed to be very weak, emaciated, and begging for alms. She was apparently well until 4yrs prior to presentation when she started losing weight despite having good appetite, there was associated history of polyphagia, polyuria and secondary enuresis. Patient denied history of dysuria, urgency, and suprapubic or loin pain. On account of these symptoms, she was taken to a private hospital and

was managed on out-patient basis for suspected diabetes mellitus with various injections which the patient could not remember. The symptoms were said to have temporarily abated, however treatment was stopped due a misunderstanding/ conflict between her parents, leading to the mother relocating from Benue state (North-East Nigeria) to Ekiti state (South-West Nigeria) with the patient. No orthodox treatment was sought since their arrival in Ekiti State. The parents have been separated in the last 4yrs. She has two siblings and a stepbrother of ages 17, 7 and 3 years respectively, all alive and well. She started begging for alms nine days before presentation following her voluntary departure from her step father's house. She also claimed her stepfather usually beat and maltreat her, but denied any history of sexual abuse.

Examination finding at presentation revealed a chronically ill looking girl, who had a haggard old woman appearance, fluffy hair interspersed with generalized whitish scalp rash, hyper-pigmented rash around right scapular area, the back, chest and both upper limbs. She was not pale, anicteric, not cyanosed, no significant peripheral lymph node enlargement, no pitting pedal oedema. Her sexual maturity rating was pre-pubertal (Tanner stage 1 for breast and pubic hairs). She had a very low weight of 21kg (< 5th percentile), a low-normal height of 140cm (between 10th and 5th percentile). She had a normal heart rate of 110bpm and blood pressure of 90/60mmHg. She was conscious but very weak, restless and miserable with severe generalized muscle wasting (Figures 1 and 2). She was not dyspnoeic, had a normal respiratory rate of 25cpm and vesicular breath sound. An assessment of Type

1 diabetes mellitus with chronic malnutrition was made. The random blood glucose (RBG) at presentation was unrecordably high. The patient was resuscitated with normal saline for the first 2 hours after which insulin infusion was commenced at 0.1IU/kg/hour. RBG was monitored hourly and it progressively dropped to 5.1mmol/l over 5 hours on admission with patient becoming very active and eating voraciously. She also had frequent passage of loose stool. Other investigations result were Urinalysis (glucose ++++), Full blood count (PCV 30%, total WBC 8300, neutrophil 65%, Lymphocytes 32%, Monocyte 1%, Eosinophil 2%). She was given I.V. Ceftriaxone 1g 12 hourly. Patient made remarkable improvement within 24 hours; subsequently subcutaneous insulin (NPH and Soluble insulin) was commenced while insulin infusion was discontinued 2 hours afterward. Patient lived on charity while on the ward and had sustained clinical improvement. Her mother was located few days into admission and brought to stay with her in the hospital; she left after one week. Patient refused to follow the mother back home and was eventually transferred to Government transition home under the care of a Community Health Extension Worker who was taught how to supervise patient's blood glucose monitoring, insulin administration and diet.

Discussion

Chronic malnutrition is a major contributor to morbidity and mortality among children worldwide [6]. With children in developing countries mostly affected. Lack of access to adequate nutrition is a major cause in most cases but there are also many children with underlying non-communicable diseases like diabetes who



Figures 1



Figures 2

are wasting away because of delayed diagnosis, lack of access to insulin or maltreatment from poor understanding of the patient's health challenges as occurred in the index case. Lack of access to insulin remains the most common cause of death in diabetic children globally [2] and the remarkable response of the index patient to insulin therapy within one week further supported this. Disease-related malnutrition can result from reduced dietary intake, increased nutrient losses, malabsorption, or altered metabolic demands. In type 1 diabetes, there is relative or absolute lack of insulin leading to reduced utilization of glucose by the body cells thereby creating a state of "starvation". Repeated attempt by the body to use other substrates to generate glucose and energy results in muscle wasting and break down of fat. With the breakdown of fat, ketones are produced. The presence of ketones may cause nausea, vomiting, abdominal pain and an altered level of consciousness. With worsening dehydration and acidosis, the child will develop circulatory shock. Left untreated, this will cause death. Death may be the result of severe dehydration, acidosis or changes in electrolytes.

There is need to create more awareness among the populace that bedwetting in older children could be due to diabetes mellitus and this can be effectively treated with insulin if diagnosed early. Our patient stopped bedwetting from the very first day on insulin therapy. Molestation of children is rampant in developing countries and this must be stopped through advocacy from health workers and legislation by the Government. The index patient had suffered physically, emotionally and socially making her to turn to begging for alms publicly which would have further expose her to further vices like prostitution, rape, drug addiction, stealing and might have become a victim of kidnapping or ritual killing. The index patient appeared naturally intelligent but educationally disadvantaged because of the parents' poor financial status, which had also affected her growth and health. The government officials who picked her up and brought her for treatment needed to be commended and encouraged to keep up the good work by putting machinery in place to regularly look for and rehabilitate homeless children and vagrants in our communities. There is also need for more public-private partnership to make insulin readily available for diabetic children in developing countries. The insulin used for the index patient was part of the free stock supplied by IDF/ Life for a Child in Collaboration with Society for Paediatrics and Adolescent Endocrinology of Nigeria (SPEAN) [3].

The patient had diarrhea for few days on admission; this might likely be due to the effect of chronic malnutrition on the intestine leading to villus atrophy and malabsorption [6]. This improved remarkably with insulin therapy, antibiotics and micronutrient supplementation. This case report brings to the fore the peculiarity of childhood diabetes mellitus in Sub-Saharan Africa and the need to adopt multidisciplinary approaches for effective management and prevention of complications [7]. Vagrants of all age groups in our communities should be given proper medical attention and rehabilitation by the Government.

Conclusion

Chronic malnutrition is an uncommon presentation of type 1 DM in adolescents. Poverty and family conflict was a contributing factor to patient's chronic malnutrition and vagrancy. Public-private partnership and multidisciplinary approaches are vital for effective management of DM among children and adolescents in developing countries. More attention should be given to vagrants in our communities for prompt treatment and rehabilitation.

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