

Inadvertent Use of Oral Corticosteroids Leading to Iatrogenic Cushing Syndrome in an Infant with Down Syndrome

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ABSTRACT

Children with down syndrome often have an increased predisposition to recurrent viral related wheezing episodes and other issues like increased oropharyngeal secretions due to hypotonia. Lower airway anomalies such as tracheobronchomalacia and tracheal stenosis are also common. Children with tracheal abnormalities may have a chronic cough or noisy breathing and these conditions are often misdiagnosed as asthma. Here, we present a case report of a six-month-old baby with down syndrome who was misdiagnosed as having bronchial asthma at two months of age because of recurrent episodes of noisy breathing and was prescribed oral steroids which the parents continued in an unsupervised manner. The child presented with increased buccal fat and buffalo hump and was diagnosed as iatrogenic cushing syndrome after investigations. Steroids were gradually tapered and stopped gradually. On follow-up the child had fully recovered and had no signs of hypercortisolism.

Keywords: Children, Hypercortisolism, Steroid

CASE REPORT

A six-month-old child with birth weight 2.6 kg presented to our hospital with phenotypic features of down syndrome [Table/Fig-1,2] and recurrent episodes of noisy breathing since two months of age. There was no history of maternal hypertension/ drug intake/ diabetes mellitus or any significant antenatal history. The child history revealed that he had been on oral prednisolone since the age of two months when he first visited to private practitioner, where he was prescribed steroid prednisolone at 2 mg/kg of body weight which patient took for four months before he presented to us. This drug was prescribed in view of diagnosis of Bronchial Asthma made by the private practitioner. No mention of Down syndrome was made to attendants outside and this diagnosis of down syndrome was made at our hospital. Further investigations including karyotyping confirmed chromosomal picture of 47, XY+ 21 which was consistent with down syndrome.



[Table/Fig-1,2]: Phenotypic features of Down Syndrome.

On examination the child had upward slanted palpebral fissures, epicanthal folds, flat nasal bridge, short neck and was markedly hypotonic. In addition, he also had a buffalo hump and increased buccal pad of fat. He measured 6.7 kg. Occipito-frontal circumference was 40 cm. Blood pressure was found to be 80/50 mmHg. Other investigations revealed random blood glucose to be 84 mg/dL, renal and hepatic functions were normal.

Lipid Profile showed: Serum cholesterol- 178 mg%; Serum Triglycerides-324 mg%; Low Density Lipoprotein (LDL)-65 mg%; Very Low Density Lipoprotein (VLDL)-34 mg%; and High Density Lipoprotein (HDL)-41 mg%. Serum Electrolytes-Serum Sodium-144 meq% and Serum Potassium-3.5 meq% (within normal limits as child was not in adrenal crisis). Basal morning serum cortisol level

was 3.20 µg/dL (within normal limits as child was not in adrenal crisis Normal range: 7-20 µg/dL) and ACTH was 1.34 pg/mL (normal range 10-60 pg/mL) which confirmed the diagnosis of iatrogenic cushing syndrome. Ultrasound abdomen revealed no suprarenal mass.

Prednisolone was gradually tapered over six weeks and subsequently stopped. At three month follow-up the child had fully recovered with no signs of hypercortisolism. Weight remained static at 6.7 kg where in routine course of events child should have gained some weight.

DISCUSSION

Cushing syndrome in children is rare. The most common cause of cushing syndrome in children is exogenous use of oral/topical glucocorticoids. Prolonged use of corticosteroids for pulmonary, autoimmune, dermatologic, haematologic and neoplastic disorders leads to loss of negative feedback function of HPA (Hypothalamo-Pituitary) axis and therefore manifestations of cushing syndrome [1]. Respiratory complaints in down syndrome are well known and are a reason for almost 80% hospitalisations in children with down syndrome [2]. A high incidence of viral induced wheezing has been reported in children with down syndrome, however evidence of association of down syndrome and asthma is still lacking. Other respiratory illnesses include pneumonias, aspiration and upper airway problems like Obstructive Sleep Apnoea (OPA) [3-5]. Central hypotonia is an important cause of respiratory morbidities in children with down syndrome. In this case, the child was misdiagnosed as having bronchial asthma and was prescribed prednisolone which was taken unsupervised.

Oral and topical steroids are extensively used by medical practitioners for treating various conditions. Iatrogenic cushing syndrome is caused by exogenous intake or application of steroids and is the most common cause of cushing syndrome in children [6]. The clinical presentation may vary from hypertension, hypokalemia, dyslipidemia, hyperglycaemia, HPA- axis suppression, glaucoma, cataract, skin atrophy and striae to life threatening infections. Most patients present with red, full moon face, growth retardation, central obesity, fat accumulation between shoulders and above the collar bone. Osteoporosis is common and may lead to pathological fractures [7,8]. In present case, there was dyslipidemia, central obesity and fat accumulation (also buffalo hump).

It is known that if steroids are used for more than four weeks at doses higher than physiological doses, secondary adrenal cortex atrophy

may develop as a result of inhibition of Corticotropin Releasing Hormone (CRH) and Adrenocorticotropic Hormone (ACTH). An average of six-week period is needed to restore the gland secretory function after discontinuation of the drug [9]. The cases also reported use of topical steroids, mostly for diaper rashes which lead to cushing syndrome [10]. These patients are managed by slowly tapering the dose of steroids. Sudden stoppage of steroids after chronic usage might land up the patient in adrenal crisis. Tapering slowly helps in reversing the effects of adrenal gland atrophy [11].

CONCLUSION(S)

This case highlights the inadvertent use of prednisolone for treating cough. The authors would like to stress that it is important to find out the cause of cough rather than treating it blindly with over the counter drugs. In the index case the cause of cough and noisy breathing was hypotonia because of down syndrome but he was chronically treated with oral steroids which led to iatrogenic cushing syndrome. Overuse of over the counter drugs including steroids should be avoided and when used the patients should be followed-up strictly to avoid the adverse effects of the same.

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