

The cortisone misuse

Health 17.4.02
Dawn

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CORTISONE and related drugs (cortisol or steroids) were introduced in the early 1950s. Cortisol is synthesized through the cholesterol from the adrenal gland. Each adult adrenal gland is a pyramidal structure situated on the upper pole of each kidney. Its average weight is only 2-gms, but its functional importance is way out of proportion to its size and its impairment can lead to serious diseases and even death.

This gland has two portions: an outer cortex and an inner medulla. Adrenal cortex has three portions called zones, and one of them is responsible for the synthesis of cortisol. Adrenal cortex is under the control of pituitary gland and hypothalamus (in the brain). Both of these structures control adrenal cortex through an axis called the 'hypothalamic-pituitary-adrenal axis'. Disturbance in any one of these structures results in over- or under-production of cortisol. This axis has a diurnal variation, i.e. steroid hormonal levels fluctuate at different hours of the day. Hormonal level in the morning is different from the level in night of the same day.

The clinical importance of adrenal gland was appreciated in 1849 by Addison. Three major categories of hormones are secreted by the adrenal cortex.

1. Glucocorticoids are represented by cortisol, and cortisone. Their synthetic equivalents are prednisone, prednisolone, methylprednisolone, triamcinolone, betamethasone, and dexamethasone.

2. Mineralocorticoids are represented by deoxycorticosterone, and aldosterone. Its synthetic equivalent is fludrocortisone.

3. Androgens and Estrogenic compounds.

The major action of glucocorticoids is anti-inflammatory, while that of mineralocorticoids is salt retention, although there is considerable overlap in these actions. Glucocorticoids were first named as such because their major effect is on glucose metabolism, although it is known now that all these hormones are essential for many different actions and act in

virtually all body tissues.

Among these compounds, betamethasone and dexamethasone are the highest anti-inflammatory whereas, fludrocortisone is salt-retaining. Cortisol, cortisone, prednisolone are all anti-inflammatory but have some salt-retaining potency as well. Likewise, a strength of 25-mg cortisone is equivalent to 20-mg of cortisol, 5-mg of prednisolone and 0.75-mg of betamethasone and dexamethasone.

Uses Cortisone is an essential medicine for the treatment of adrenal insufficiency of any cause. Adrenal insufficiency may either be due to destruction of gland itself (primary defect) or due to defects of pituitary or hypothalamus (secondary defect).

Cortisone and its synthetic analogues can be life-saving drugs when used correctly and under medical supervision. The reason for their disrepute is their use by various quacks, hakims, homeopaths and, unfortunately, even by some allopathic doctors in conditions where these should not be used

Congenital adrenal hyperplasia is another disease in which cortisol production is reduced due to a deficiency of an essential enzyme required for its synthesis. This leads to over-production of androgens (male hormones). Treatment with cortisol or related drugs can reverse this process.

Systemic (injectable as well as oral) glucocorticoids are used in acute cases of bronchial asthma and can be life-saving, but are usually avoided for long-term use due to side-effects. The inhaled preparations are the mainstay of treatment of bronchial asthma and are suitable for long-term use due to lack of any serious side-effects. Steroid creams were marketed in 1952 for use in skin diseases. Its long-term use can result in systemic side-effects due to partial absorption.

Connective tissue and autoimmune disorders are also treated with

steroids. Examples include systemic lupus erythematosus, polyarteritis nodosa and other forms of vasculitis. Steroids are also given in allergies like hay fever, serum sickness, urticaria, contact dermatitis, drug reactions and bee stings. Sarcoidosis, idiopathic thrombocytopenia and hemolytic anaemia are also successfully treated with cortisone. It is an important agent, which is used to prevent graft rejection in organ transplantation.

The withdrawal of cortisone from patients receiving this medicine may result in flare-up of underlying cause. Abrupt withdrawal leads to serious consequences. This results due to suppression of hypothalamic-pituitary axis, as all of us need some cortisone

used correctly and under medical supervision in conditions mentioned above. The reason for its disrepute is mostly due to its use by various quacks, hakims, homeopaths and unfortunately even by some allopathic doctors in conditions where these should not be used. Sometimes these are used in conditions where their use is indicated, but this is done without regard to its various complications and side-effects. It has been observed that even some physicians tell the patient to abruptly stop using cortisone prescribed for a valid reason and this can result not only in a flare-up of underlying condition being treated, but can also result in death of the patient.

The abuse of anabolic steroid is also not uncommon. Anabolic steroids are synthetic male sex hormones and cause growth of muscles and development of male sexual characteristics. French physiologist Charles Edouard Brown-Sequard announced in 1889 that an extract of dog and guinea pig testicles given intravenously results in an increase in physical strength, improvement in intellectual energy, relief of constipation and lengthening of the arc of urine. The androgens were first isolated in late 1930s. Use of androgenic anabolic steroids became common after 1945. Body builders, weight lifters, athletes and other sportsmen use it to get better outcome but this also results in other problems. Even female athletes have used it to enhance performance. Use of anabolic steroids has been banned in Olympics and other athletic sport competitions and athletes are routinely checked for it.

The valid use of androgenic anabolic steroids has increased almost by 400 per cent, mostly attributable to treatment of AIDS-associated wasting and in weight loss due to some chronic illnesses. Administration of testosterone is indicated in hypogonadal men.

The long-term use of androgenic steroids can reduce fertility, and is also associated with testicular atrophy, tendon injuries, sleep irregularities and enlargement of male breasts.

Cortisone and related drugs are not only life-saving but their valid use has resulted in prolonged life as well as enhanced quality of life in many diseases which had no cure before the discovery of these compounds. But these drugs need to be used under medical supervision with proper precautions to prevent complications. ■

for survival. Patients may take several weeks to months or years to recover normal function. In severe cases patients become dependent on cortisone for life.

The prolonged use of cortisone may result in hypertension, diabetes mellitus and increased susceptibility to infection, muscle aches, behavioural changes, cataract and osteoporosis. A full bloom picture of Cushing's syndrome (a disease first described by Dr Harvey Cushing in which there is excessive secretion of cortisol and related hormones) may develop in an individual, which is manifested as moon face, buffalo hump, and abdominal obesity, whereas arms and legs become thin like broom stick and the patient looks like a lemon on a stick. Cortisone also increases the chances of peptic ulcer.

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