

**Steroids In Relation To Health and Ill Health**

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**Abstract**

The present life style has given us a number of healths related or should say health hazardous disorders which are sometimes injurious to the body tissues and organ system. The reaction of body is variable towards various stimuli factors causing distress to the health of human being. Acute and chronic are the two terms used in regard to the nature of disease. Acute illness conditions as well as other illness are sometimes life threatening and body many of the time surrenders against such instances. In such critical conditions body needs external support of the medicines which helps body to overcome from the critical phase. Such drugs which are also known as Life saving agent are nothing but the Steroids. The use and disuse of the steroids is crucial as inspite of being beneficial to the body, these drugs also having adverse effect. In the present article we will study many things about steroids.

**Keywords:** Steroids, Health, Life saving agent

**Introduction**

Steroids are synthetic glucocorticoid hormones. Steroids are wonder drugs as discovered by man. Steroids are available in prepared forms as well as human body manufactures them also.

Available form of steroids:

1. Natural – found in the body as hormones like hydrocortisone, corticosterone and aldosterone
2. Synthetic – human made steroids (artificially made in laboratories) which are used as drugs like prednisolone, betamethasone and dexamethasone

Human body itself produces steroids by one of its organ known as adrenal gland. Adrenal glands are small paired gland found on the upper pole of each kidney and weighs about 4 gm each [1]. Although small, these glands are very important for functioning of our body. Adrenal gland produces three classes of hormones. These hormones are produced by the cortex part of the adrenal gland which is a outer portion and constitutes 80% of the gland [2]. Cortex part of Adrenal gland produces 3 hormones known as Corticosteroids are as follows [3]:

1. Mineralocorticoids
2. Glucocorticoids
3. Androgenic steroids (Sex hormone)

**Mineralocorticoids** act on the mineral (electrolyte) metabolism especially sodium and potassium and hence the name Mineralocorticoids [4]. Mineralocorticoids help to conserve salt and regulate blood pressure. Mineralocorticoids are Aldosterone and 11, Deoxycorticosterone.

90% of mineralocorticoid activity is provided by aldosterone. Aldosterone is very essential for life and it is usually called the life saving hormone. Total loss of corticosteroids usually causes death within 3 days to 2 weeks and it is mainly because of loss of mineralocorticoids. Without mineralocorticoids, the potassium ion concentration of the ECF rises markedly. The concentration of sodium and chloride ions decreases. The total ECF volume and blood volume are also greatly reduced. All these changes lead to cardiac dysfunction, shock like state and finally death. The entire sequence can be prevented by administration of aldosterone. That is why it is known as life saving portion of corticosteroids [5].

**Glucocorticoids** act on mainly glucose metabolism and hence the name glucocorticoids. Glucocorticoids are Cortisol, Corticosone and Cortisone. Cortisol also known as Hydrocortisone is more potent and it has 95% of glucocorticoid activity, Corticosone is less potent showing only 4% of glucocorticoid activity, Cortisone with 1% activity is secreted in minute quantity. Cortisol is a life protecting hormone because it helps to withstand the stress and trauma in life. Glucocorticoids have metabolic effects on carbohydrates, proteins, fats and water. The removal of adrenal glands in human beings causes disturbances of metabolism. Exposure to minor harmful stress after adrenalectomy leads to collapse and death [6].

**Sexcorticoids** are also secreted by adrenal gland. Most of the hormones secreted are male sex hormones (androgens) but small quantity of estrogen and progesterone are also secreted by adrenal cortex. Androgens secreted by adrenal cortex are Dehydroepiandrosterone, Androstenedione and Testosterone. Among these hormones Dehydroepiandrosterone is the most active adrenal androgen. Androgens are generally responsible for the masculine features of the body [7].

#### **Modes of Administration of Steroids**

1. Tablets, Injections and Syrup – commonest mediums of steroid administration
2. Local injections for joints, tissues and muscular diseases
3. Sprays for the nasal cavity, metered dose inhalers and dry powder inhalers for the lungs
4. Eye and ear drops, ointments, lotions and creams for application on skin
5. Retention enemas for the diseases of the large intestine

#### **Beneficial Effects of Steroids**

1. Reduces harmful inflammation as seen in tuberculosis of the meninges and brain
2. Reduces allergic disease induced inflammation
3. Suppresses immunity and thus useful in cases of overactive immune system as seen in autoimmune diseases like Rheumatoid arthritis
4. Helps in reducing the size of tumors by killing of cancer cells
5. Used as replacement therapy in case of destruction of adrenal glands by disease or after surgical removal of the adrenal glands

### **Conditions Where Steroids Are Prescribed**

1. Autoimmune diseases like rheumatoid arthritis, systemic lupus erythematosus, vasculitis, hemolytic anemia, transplant rejection etc.
2. Allergic diseases like bronchial asthma, allergic rhinitis, skin allergies and transfusion reactions
3. Cancers like lymphoma, leukaemia and myeloma
4. Severe infections like brain tuberculosis, some type of pneumonias
5. Adrenal gland failure

### **Side Effects of Use of Steroids**

Side effects or the adverse effects of steroids depends upon many factors like

- a. The type of usage - oral or injectable are more likely to cause side effects
- b. Duration of effect- short acting verses long acting more likely to cause side effects
- c. The dose - higher the dose greater the risk of developing side effects
- d. Duration of treatment – longer the treatment greater the chance for side effects

Side effects of steroid usage can be categorized as Immediate effects or Long term effects

Immediate effects (short term usage – one week duration) can be seen in forms of

1. Irritation of stomach lining
2. Increased blood sugar level
3. Foot swelling
4. Increased hunger
5. Change in mood

Long term steroid usage effects can be seen in the form of

1. Alteration in the body immunity
2. Weight gain, facial swelling and fat deposits leading to “moon face” Or “buffalo hump’
3. Thinning of skin, striae, easy bruising, delayed healing, fungal infections, acne
4. Metabolic derangements like increased blood sugar level
5. Muscle weakness all over especially in hips and shoulders
6. Eye related disorders like cataract and glaucoma
7. Mood changes especially fluctuating moods like euphoria alternating with irritation, aggression, depression and insomnia
8. Weakening of bones of the body known as osteoporosis
9. Increased susceptibility to infections
10. Gastric irritation and ulceration
11. Hoarseness of voice due to inhaled corticosteroid
12. Oral thrush

### **Misuse of Steroids**

Steroids are one of the most misused drugs. Cautious use of any drug definitely will help but misuse produces drawbacks or should say hazards. The most common types of misuse of steroids are as:

1. To produce a rapid relief of symptoms like fever, bodyache etc. in common infections is the most common misuse of steroid
2. In the absence of diagnosis, to produce symptomatic relief
3. In the treatment of inflammatory conditions of the skin, when steroids are combined with anti – fungal agents or antibiotics in the same preparation
4. Anabolic steroids are also misused by athletes and sportsperson to improve their athletic performance,( hence these drugs are also called as Performance enhancing drugs and their use is often referred to as Doping)

### **Precautions For The Use Of Steroids**

Steroids are life saving drugs that should be used with precaution under the guidance of a certified medical practioner as steroid use can worsen some diseases like diabetes mellitus, hypertension, heart failure, glaucoma, psychiatric illness, peptic ulcer, untreated tuberculosis etc. After judging the risks and benefits of steroids, the drugs can be used. Some precautions are listed below for the use of steroids:

1. The patient should be interrogated for a history of peptic ulcer, diabetes, tuberculosis and other infections before the starting of the steroids
2. The patient's weight and blood pressure should be monitored regularly
3. Any infection present should be treated simultaneously
4. In case of surgery is required or in case of acute infection, the dose of steroid should be increased
5. Steroid interact with many other types of drugs that may increase or decrease their function
6. The treatment with steroids should not be stopped abruptly especially with high doses and after prolonged treatment (more than 3 weeks), as the production of natural steroids is suppressed. The dosage should be decreased gradually (tapered) and then stopped over several weeks
7. Topical steroids preparations especially for skin should be used carefully, They should be applied sparingly on the affected areas only and not more than twice daily. Prolonged use should be avoided especially on the face
8. Eye drops containing steroid should not be used in case of suspicion of infection

### **Discussion**

As per the total information regarding steroids, it should be kept in mind by the user of this drug that both aspects of steroid use that is beneficial as well as harmful are there and it depends on how, when and where steroids should be used. Steroid provides life in life threatening conditions as well as steroids imparts a hazardous impact on health if used abruptly. It is need of the time to understand this wonder drug properly with precaution.

### **Conclusion**

To conclude the topic, it is tried best to provide information about steroid. Their occurrence, physiological as well as pharmaceutical, modes of administration, benefits of steroid therapy, harmful effects of steroid therapy, conditions where steroids can be given, misuse of steroids, method of giving and taper off and precautions for the use of steroid therapy is

discussed well. I hope the present article will help the readers to judge the use of steroids for a good health as per the demand of the time

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