Health Risks Associated with Corticosteroid Therapy in Treatment of Pediatrics Patients

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BACKGROUND. Corticosteroids, or steroids, are a common medicinal treatment for various diagnoses to alleviate a wide range of symptoms.

- The regulation and response of steroid hormones are incredibly important in physiologic processes.
- In medicinal applications, many practitioners use them to treat various illnesses.
- Adverse drug reactions in adult patients, the relative risk levels and implications for pediatric application remain understudied.

CORTICOSTEROID MECHANISMS.

Laboratory-synthesized hormones derived from the adrenal cortex, including glucocorticoids and mineralocorticoids.

- Glucocorticoids primarily regulate metabolism and immune function, mineralocorticoids control electrolyte balance and fluid homeostasis.
- Focusing on glucocorticoids, they are released in the glands through circadian rhythms triggered by internal and external stressors. This is done through the hypothalamic-pituitary-adrenal (HPA) axis for regulation

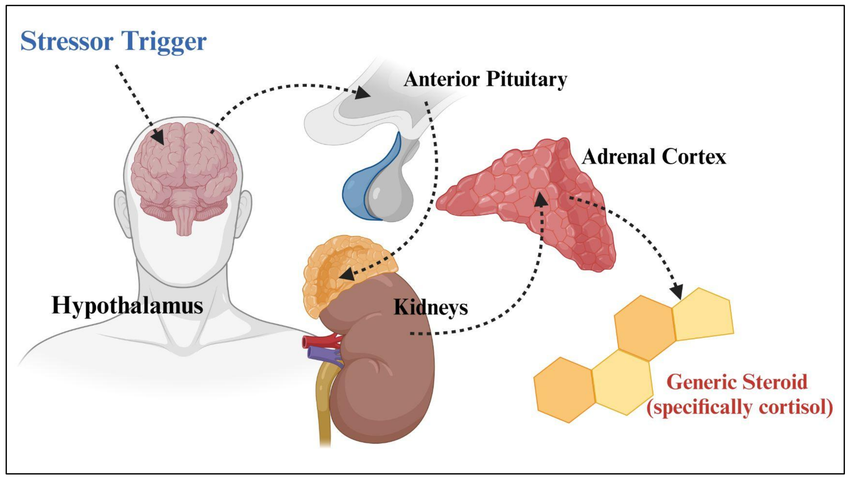

Figure I. *Corticosteroid Mechanism Generic Pathway through the hypothalamic-pituitary-adrenal (HPA).*

- Prescription corticosteroids shortcut natural mechanism

METHODOLOGY. A systematic search of 22 scientific sources was conducted using predetermined research studies related to corticosteroid treatment in pediatric health, specifically analyzing primary and secondary literature. Popular literature was not taken into account for this literature review.

DISEASES AND CONDITIONS TREATED BY STEROID PRESCRIPTION. Due to the versatility of corticosteroid usage in medical practice, it is a common prescription for variety of conditions (refer to Table I). Different dosages and routes of administration of corticosteroids allow specific treatments to address conditions effectively (e.g., topically, intraarticularly, via inhalation, or epidurally).

Figure III. *Health complications recorded in pediatric patients after steroid dependency established (Figure taken from Croitoru et al.).*

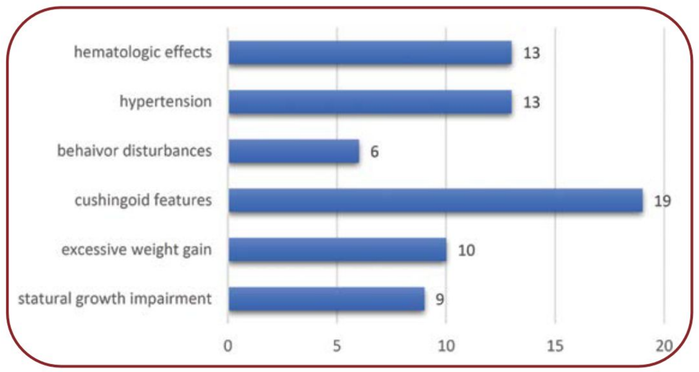

Table I. *Most common indications of systemic corticosteroids in pediatric patients (Adaptation of Table Ferrara et al. 2019)*

Rheumatologic disorders
Juvenile idiopathic arthritis
Pediatric Vasculitis
Dermatomyositis
Scleroderma
Systemic lupus erythematosus
Rheumatic fever
Uveitis
Gastrointestinal disorders
Ulcerative colitis
Crohn disease
Autoimmune hepatitis
Respiratory diseases
Asthma
Viral wheezing
Croup
Cystic fibrosis
Autoimmune cytopenia
Endocrinological disorders
Adrenal insufficiency
Neurological disorders
Demyelinating disorders
Autoimmune encephalitis
Idiopathic intracranial hypertension
Idiopathic facial palsy
Nephrological disorders
Nephrotic syndrome
Dermatologic disorders
Chronic urticaria
Atopic dermatitis
Alopecia areata
Vitiligo
IgA linear bullous dermatosis
Herpetiformis dermatitis

- Steroid Dependency yielding correspondence with in physiological dependence (Yap et al. 2001).
- HPA Axis Functionality Effects
  - Long-term dysregulation of their HPA axis through increased cortisol suppression in response to oral dexamethasone (Gordijn et al. 2012).
- Such studies, including steroid dependency in pediatric patients, have also noted numerous complications (Croitoru et al.).

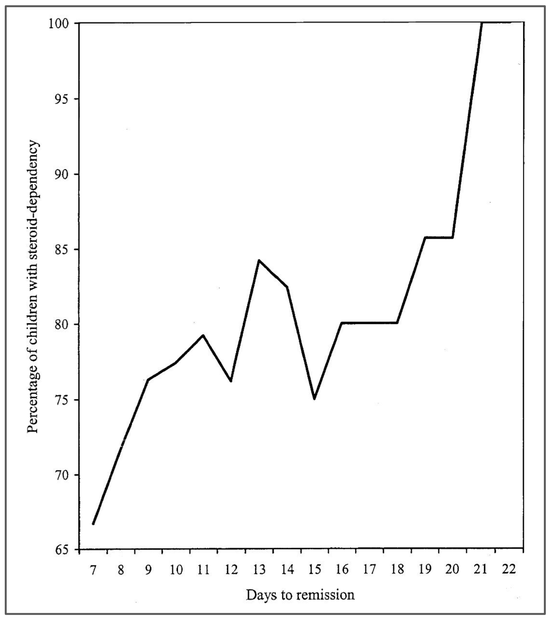

Figure II. *Steroid Dependency vs. Remission Rates of Pediatric Patients Based on Physiological Chances (Figure taken from Yap et al. 2001).*

DISCUSSION. Providers must consider and educate patients on the various health implications that corticosteroid prescription causes. Potential harm from steroid usage can be severe and can cause long-lasting effects, especially on the pediatric patients that it treats.

- ➢ Growth and development and hormonal balancing in adolescence is impaired
- ➢ Endocrine dysfunction leads to physiological dependence in HPA axis = addictive behaviors and psychological effects.
- ➢ Showing how corticosteroids can disrupt normal growth and delay skeletal maturation
  - Correlation of stunted growth in children (Ramamoorthy and Cidlowski 2016)
  - Impair linear growth and decrease final adult height potential in pediatric patients

FUTURE DIRECTIONS. Though major evidence shows the adverse effects of steroid treatment on pediatric patients, there is a large gap in critical correlation with this therapy. Meticulously dosage regulation is crucial and proper education on all scopes of prescription and treatment courses.

- ➢ Rather than treatment for inflammation inhibition as a whole, non-steroidal anti-inflammatory drugs (NSAIDs) and disease-modifying antirheumatic drugs (DMARDs) can be relevant to alleviate symptoms as they have significantly lower adverse health risks (Jose et al., 2022)
- ➢ If alternative medicating routes are not feasible, administration of steroid can be considered (Joly et al. 2002)

SCAN HERE FOR REFERENCES

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