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STEROID UTILIZATION IN CHILDREN: A FOCUSED EVALUATION AT A MAJOR CARE FACILITY

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ABSTRACT

Steroids are naturally occurring hormones used in pediatrics to treat conditions like asthma and allergies and reduce inflammation. While effective, their prolonged use carries risks, including potential side effects. The present study was carried out to analyze the reasons for prescribing steroids and to identify the most commonly used corticosteroids, it also focused on evaluating clinical outcomes, adverse drug reactions (ADRs), and the duration of steroid use. Data was collected from inpatient and outpatient wards, including patient demographics, medical history, and steroid prescription details, with informed consent obtained from participants. Over 6 months, 150 pediatric patients were included in the study, primarily steroids prescribed for bronchopneumonia, pharyngitis, and respiratory issues. The most commonly used steroids were Methylprednisolone(38%), Dexamethasone(30.7), and Hydrocortisone(8.7%), Budesonide(2.7%) and Prednisolone(2%). At discharge, 48% showed improvement but remained on steroids, 20.7% were still improving with steroid treatment, and 31.3% fully recovered and no longer required steroids. This study found that the steroid use was appropriate, with no reported adverse drug reactions (ADRs) or drug-drug

interactions (DDIs). Conversions of steroid type (sequential and switch-over method) and tapering were implemented to prevent flare-ups and ensure safe treatment practices**.** These studies also emphasize educating healthcare providers and parents to improve management, safety, and therapeutic outcomes in paediatric care. Therefore, prescribing corticosteroids to children requires careful evaluation of the benefits and risks.

KEYWORDS: Steroids, Adverse Drug Reaction (ADRs), Drug- Drug interaction (DDI), Prescribing, Safety, Therapeutic outcome.

1. INTRODUCTION

Drug Utilization Evaluation (DUE) evaluates prescribing, dispensing, administering, and ingesting medications to ensure safe, effective, and appropriate use. Drug Utilization Evaluation (DUE), as defined by the WHO, focuses on the medical, social, and economic consequences of pharmaceutical practices. DUE identifies issues in drug use, optimizes therapy, and minimizes adverse effects.[1] Steroids, such as corticosteroids, are synthetic hormones that reduce inflammation and are commonly used to treat conditions like asthma, juvenile arthritis, kidney disease, autoimmune disorders, and hypersensitivity reactions in children. They come in various forms including oral, topical, inhalers, and injections. Corticosteroids exert effects by binding to glucocorticoid receptors, modulating inflammation and immune responses.[2]

Steroids in pediatrics should be taken as prescribed, with doses ideally given in the morning, and never abruptly stopped after long-term use.[3] Misuse can lead to serious side effects, like cushingoid appearance (moon or chubby face) with some developing serious health issues present with recurrent respiratory infections and grossly atrophic adrenals, Misuse is exacerbated by abrupt cessation of steroids when informed of their harm, leading to dangerous withdrawal effect so always consult a doctor before administering steroids.[4]

The risk of side effects depends on the

a. Dose: low dose (< 10 mg/day of prednisone), medium dose (10-20 mg/day), high dose (> 20 mg/day).
b. Type of steroid: (long-acting or short-acting)
c. Length of treatment: (Long-term treatment > 3 months)
d. Other medical problems.[5]

Managing Steroid-Induced Side Effects

a. Use steroids only when necessary and for the shortest duration.
b. Opt. for low-potency steroids when possible.
c. Prefer topical or inhalational steroids.
d. Use adjunctive therapies (e.g., physical exercise, anti-inflammatory agents, braces in rheumatoid arthritis, or allergen reduction in asthma).
e. Consider steroid-sparing strategies like treating associated conditions (e.g., rhinosinusitis in asthma).
f. Alternate-day therapy reduces growth suppression, Cushingoid facies, and improves carbohydrate tolerance and myopathy.
g. Administer low doses in the morning to align with the circadian rhythm and reduce HPA suppression.
h. Rinse the mouth after inhalational steroid use.[3]

Steroids are contraindicated in active infections and untreated tuberculosis.[7] While steroids are effective, they can lead to significant side effects, particularly with prolonged or high-dose use. These include gastrointestinal issues, facial flushing, nocturia, dry skin, weight gain, and sleep disturbances. Steroid use can also increase the risk of infections, hypertension, and osteoporosis, as well as suppress the hypothalamic-pituitary-adrenal (HPA) axis.[2][8] Mental health changes, high blood sugar, glaucoma, Cushing's syndrome, and slowed growth in children are additional concerns.

Hence regular monitoring is essential to manage these risks.[8] Regular check-ups are essential, especially for children, to minimize risks and ensure safe use.[2][8]

2. METHODOLOGY

This hospital-based prospective observational study was conducted at a tertiary care hospital over a duration of six months. The study included both male and female patients under 18 years of age who were prescribed steroids as part of their treatment. Data was sourced from patient case sheets, communications with patients and their attendants, and discussions with doctors, residents, and nurses. Relevant data, including demographic details, diagnosis, types of steroids prescribed, and dosage information, were collected for both OPD and IP patients. The collected data was then pooled and analyzed. Ethical approval was obtained from the Institutional Ethics Committee, and Informed consent was secured from all participants or their guardians.

3. RESULTS

The observational study was conducted for a period of 6 months after obtaining the Informed consent form. During the study, a total of 150 pediatric patients who met inclusion criteria, were included in the study.

Table 01: Distribution of Patients Based on Age.

Sl. No.	Age Group	Number of Patients	Percentage
1.	0 day - 1 month	04	2.7%
2.	1month- 1year	36	24%
3.	1-3 years	32	21.3%
4.	3-6 years	26	17.3%
5.	6-12 years	39	26%
6.	12-18 years	13	8.7%
	Total	150	100%

Table 02: Distribution of Patients Based on Gender.

SI No	Gender	Number of patients	Percentage
1.	Female	58	38.7%
2.	Male	92	61.3%
	Total	150	100%

Table 03: Distribution of Patients Based on Final Diagnosis.

Sl. No	Final Diagnosis	Number of Patients	Percentage
1.	Acute GE	03	2.0%
2.	Acute Urticaria	04	2.6%
3.	Dengue Fever	31	20.6%
4.	Insect bite	02	1.4%
5.	LRTI	77	51.3%
6.	Seizure	04	2.7%
7.	Typhoid fever	05	3.4%
8.	URI	21	14.0%
9.	Fever+ cough+ cold	03	2.0%
	Total	150	100%

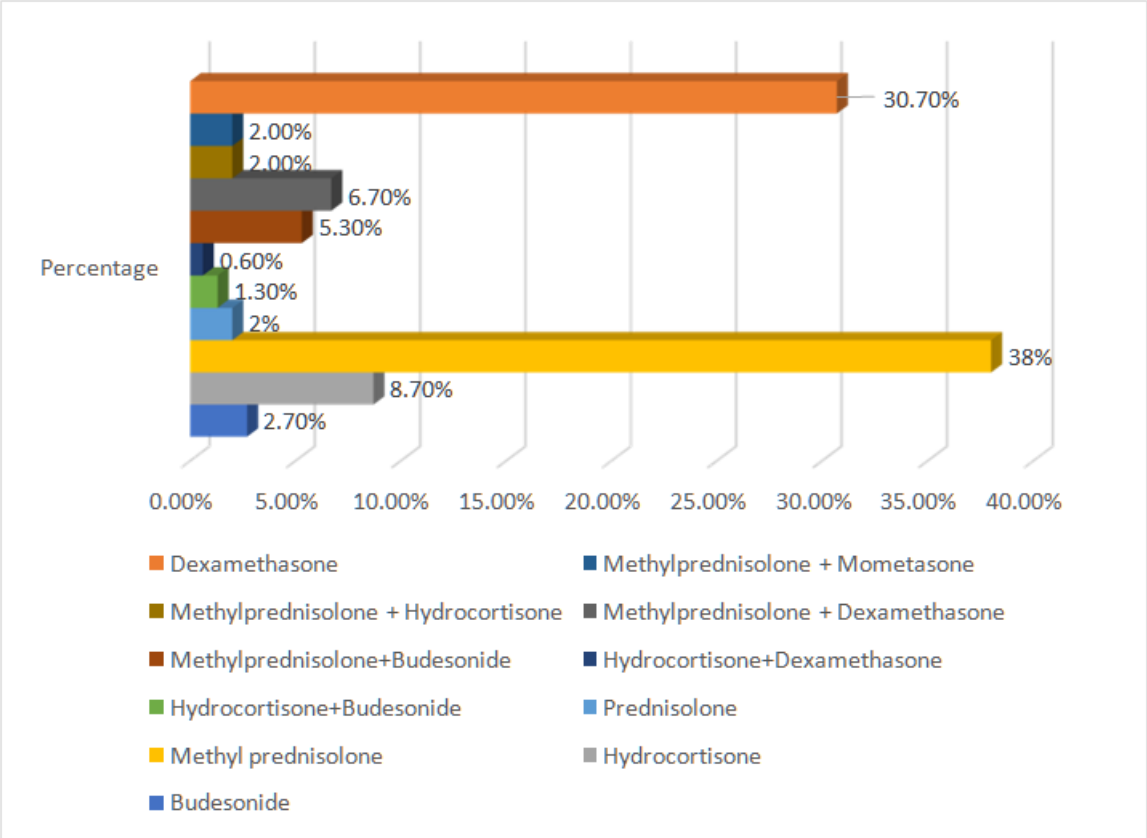

Fig. 01: Distribution of Patients Based on Type of Steroid Administered.

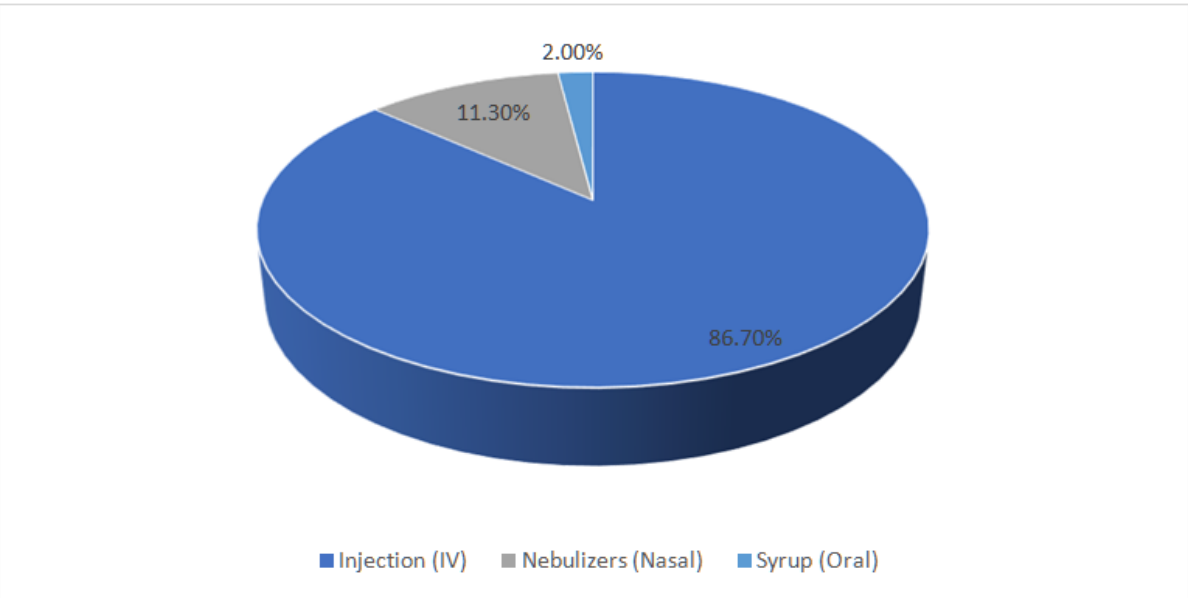

FIG 02: Distribution of Patients Based on Route of Administration of **Steroids.**

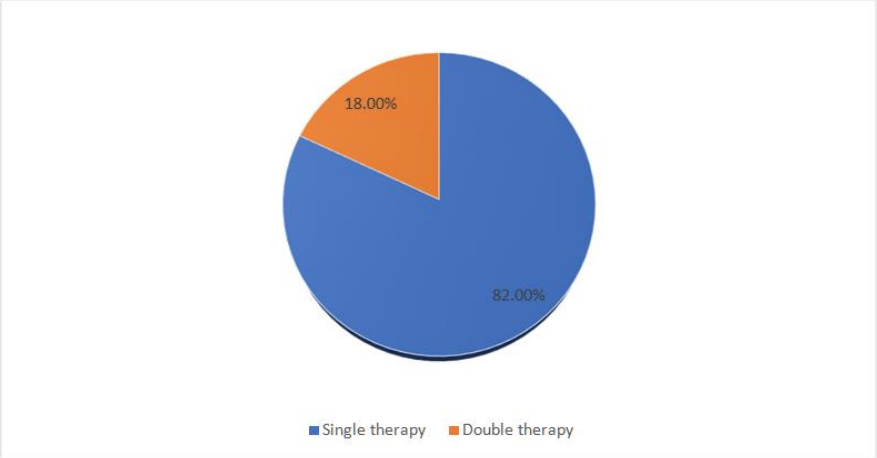

FIG. 03: Distribution of Patients Based on Type of Therapy Administered.

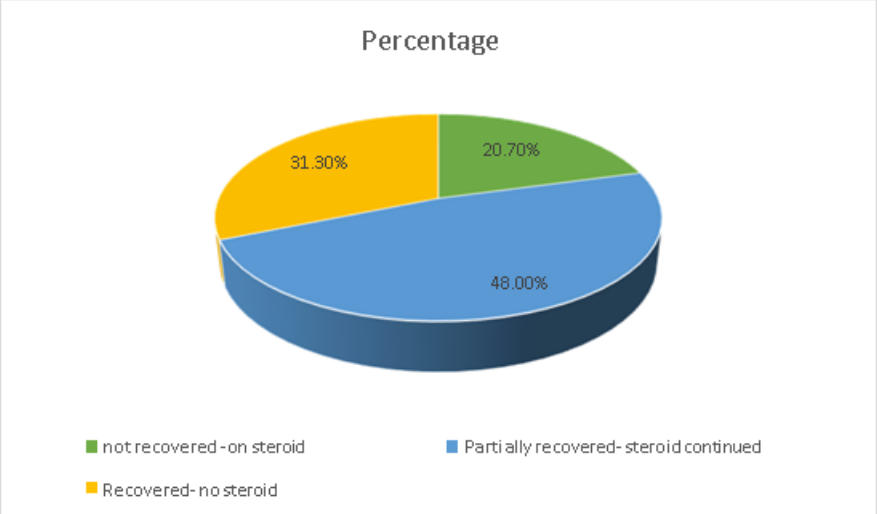

FIG. 04: Distribution of Patients Based on Discharge Status.

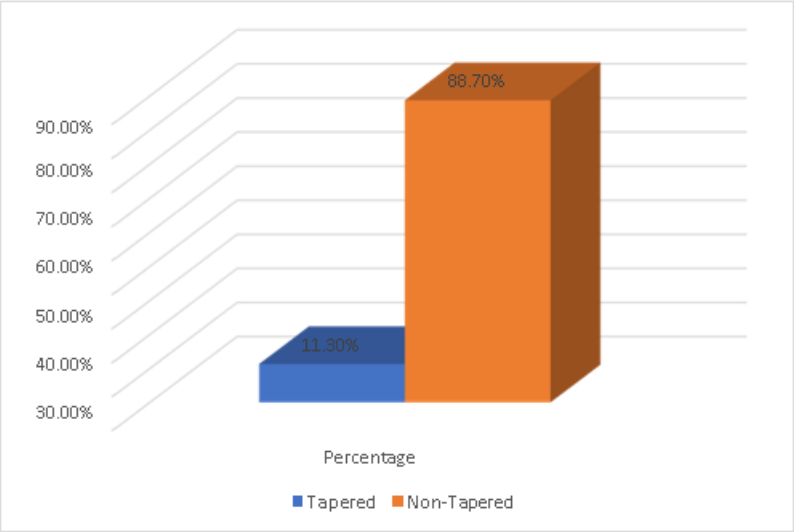

FIG. 05: Distribution of Patients Based on Type of Tapering of Steroids Administered.

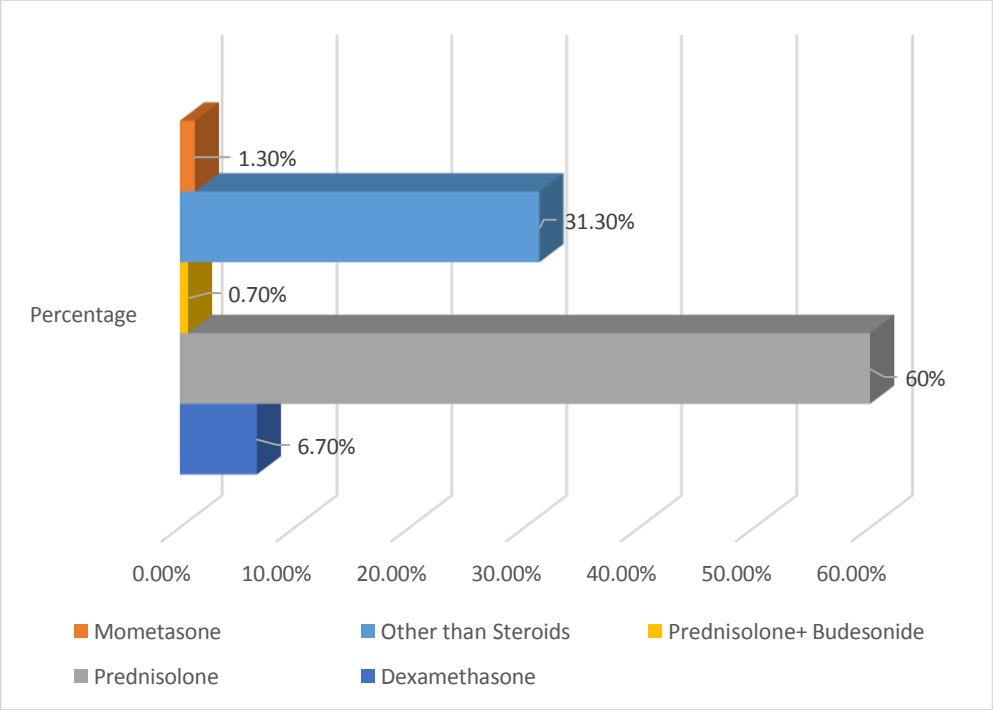

FIG. 06: Distribution of Patients Based on Discharge Medication.

4. DISCUSSION

- A prospective observational study on "Drug Utilization Evaluation Among Pediatric Population" was conducted at Tertiary care hospital for 6 months, involving 150 pediatric patients (61.3% male, 38.7%female). The age distribution included 26% in the 6-12 years group, 24% in the 1 month-1year group, and smaller proportions in other age ranges. Common diagnoses included Lower Respiratory Tract Infections(LRTI) (51.3%), Dengue (20.6%), Upper Respiratory Tract Infections (URI) (11.3%), and Seizures (2.7%). These results were relevant to the study conducted by Rahul S et al.[9] and Unnissa et al.[10]
- Steroids, particularly corticosteroids, were prescribed for various conditions, including respiratory, GI, and neurological issues. These results are consistent with the findings of a study conducted by Unnissa et al.[10]
- The most commonly prescribed steroids were Methylprednisolone (38%), Dexamethasone (30.7%), and Hydrocortisone (8.7%).This result was found to be similar to the study carried out by M Thadanki, et al.[11]
- Most of the patients (89.4%) received a stat dose of steroid. Among the study population 82% received single steroid therapy and 18% on double therapy which was found to be resemble to the study done by M.A Kumar et al.[12] Therapy modifications included switch-over treatments for 57% of patients, while 11.3% undergone tapering of steroid

dose based on their clinical condition.

- At discharge, 60% of patients were prescribed Prednisolone, followed by Dexamethasone (6.7%) and Mometasone (1.3%). Most patients received a single steroid, and no significant drug-drug interactions (DDIs) were observed. These findings align closely with the results of a study conducted by Berna TB, et al.[6]
- Our study indicated that there were 31(20.7%) patients who were prescribed with steroids and discharged with improving condition, 72 (48.0%) patients prescribed with steroids and were discharged with improved condition and there were 47 (31.3%) pediatric patients who got recovered and discharged with out steroids and the steroids usage was found to be appropriate. However, long-term safety remains a concern, emphasizing the importance of adhering to best practices in prescribing and monitoring steroid therapy.

5. CONCLUSION

This study successfully analyzed the prescribing patterns and clinical outcomes associated with steroid use in pediatric patients. It identified Methylprednisolone and Dexamethasone as the most commonly used corticosteroids, primarily prescribed for respiratory conditions such as bronchopneumonia and pharyngitis. The research underscored the positive clinical outcomes, revealing that 31.3% of patients experienced full healing without the need for further steroid use, while 48% showed improvement while continuing steroid treatment.

Furthermore, the absence of adverse drug reactions or drug-drug interactions demonstrates the safe application of corticosteroid therapies. These findings underscore the importance of appropriate steroid utilization to balance efficacy and safety, contributing to improved therapeutic outcomes in pediatric care.

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