



Case Report

Steroid induced psychosis in a child with nephrotic syndrome: A case report

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ABSTRACT

Background: and Importance: Steroids induced psychosis is one of major adverse effects of corticosteroids therapy especially in patients with disease causing low serum albumin level like nephrotic syndrome. The literature review about this adverse effects is lesser in children than adults population. The management is done by tapering dose of steroids in aid of immunosuppressive drug with an antipsychotics drug.

Case presentation: Here we present a case of 14 years old female child known case of nephrotic syndrome secondary to Focal segmental glomerulosclerosis with steroids induced psychosis who is managed by tapering dose of prednisolone with Tacrolimus as immunosuppressive and Quetiapine as antipsychotic.

Conclusion: The prevalence of steroids induced psychosis is higher in our locality which is still unreported due to lack of detailed history and proper diagnosis and it is manageable if early diagnosis and treatment is initiated. Thus, proper counselling to parents about the adverse effect of steroids therapy and timely follow up will prevent Nepalese children from this illness.

1. Introduction

Corticosteroids have been used as main therapeutic drugs for treatment for various medical illness. Following treatment and on the course of treatment, a number of adverse effects and reaction have been established, disturbance of mental state, being one of them [1].

Patient treated with corticosteroids presents various forms of psychiatric symptoms, most of them suffering from mild symptoms not fulfilling any diagnostic criteria and the average incidence of diagnosable psychiatric disorder is about 6% which is lesser than actually sufferer [1]. Most of them shows affective reaction like depression, mania, hypomania along with psychosis, anxiety, fearfulness, delusion and delirium [7].

Although the actual mechanism about the psychosis under corticosteroids therapy is not clear, some literature mentioned that it is dose-dependent and incident is higher in mega-doses [7].

The patient have higher chance of experiencing psychiatric symptoms when he/she has lower serum albumin level. Thus, patient with disease causing low levels of serum proteins like nephrotic syndrome is likely to suffer from adverse effects of steroids treatment [1].

The literature review about the steroids induced psychosis in children and adolescents is insufficient and rare though it is well known complication in adults. In the following case report, we report a 14 years

old female child with nephrotic syndrome who presented with steroid-induced psychotic disorder who was treated with antipsychotics drug (Quetiapine) and immunosuppressive drug (Tacrolimus) as an alternative one to prednisolone for the treatment of nephrotic syndrome complicating with steroids induced psychosis.

To our knowledge, this is the first reported case of steroids induced psychosis to be reported from Nepal.

This case report has been reported in line of SCARE Criteria 2020 [13].

2. Case report

A 14 years old female child a known case of hypothyroidism (controlled with Levothyroxine 25 mcg) was brought to pediatric outpatient department of BP Koirala Institute of Health Sciences (BPKIHS) with chief complaint of behaviour disturbance such as fearfulness, aggression, anxiety and seeing things that wasn't there. According to her mother, sometime she used to say herself as a goddess the one possessing divine power and become cheerful but after sometime she started crying, whispering and speaking irrelevant sentences. She used to say that there is someone in her room who peeps on her all the time and wants to harm her. She has insomnia as her sleep duration decreased from 8-10 hours to 2-3 hours a day. She has decreased

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appetite. She constantly talked about being with someone in the room not seen by others. She then developed symptoms of decreased energy, decreased activity, decreased talk even not responding to calling her name by her parents and relatives. There is no history of similar illness in past.

She was diagnosed with nephrotic syndrome a month back. There is history of recurrent generalized body swelling for one year and had taken medicine from local clinic for multiple times but swelling didn't get subsided completely. The swelling was first noticed on periorbital area of face and bilateral legs which gradually progressed to abdomen, thigh, upper limbs and was worse in the morning but regressed as the day progressed. The urine was also noticed to be frothy with gradual decrease in frequency but there was no history of dysuria and cola-colored urine.

There was no history of sore throat, skin rash, jaundice or use of injection from local health providers and blood transfusion prior to appearance of swelling. There was no significant family history, birth history, developmental history and drug history relevant to renal disease. After her general physical and systemic examination, provisional diagnosis of nephrotic syndrome was made and for the definitive diagnosis relevant blood and urine investigation (Table 1) were done along with renal biopsy. The histopathological and immunofluorescence examination showed focal and segmental glomerular sclerosis (FSGS-NOS) involving 11/34 (32.2%) of sampled glomeruli (Fig. 1). After all investigations, diagnosis of nephrotic syndrome secondary to FSGS was made.

As per management of her condition, oral corticosteroids (prednisolone) at 2 mg per kg per day in a divided dose was prescribed with proton pump inhibitors along with her previous medication Levothyroxine for hypothyroidism and advised for follow up in 2 weeks.

She did not follow up after 2 weeks and had continued the same high dose prednisolone for 5 weeks. In the fifth week of high dose

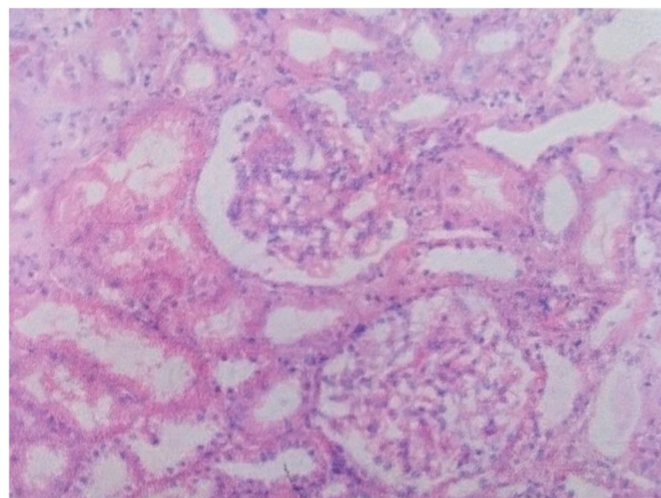


Fig. 1. Renal Biopsy; Histology film: maximum glomeruli(11/34) showing segmental tuft sclerosis with intraglomerular foam cell changes and remaining glomeruli showing focal dilatation and congestion of capillary lumina.

prednisolone therapy, she was said to have been behaving abnormally - such as fearfulness, aggression, insomnia and decrease in appetite. On admission, her vital signs, physical and neurological examination were completely normal. Her blood and urine investigation were repeated (Table 1). The organic causes of psychotic symptoms were excluded by electroencephalography. Her psychiatry consultation was done which reported presence of prominent negative symptoms on the basis of Scale for the assessment of positive and negative symptoms described by Andreasen et al. [11]. Despite the marked negative symptoms, her cooperation and orientation to time and space were complete which excluded of having secondary catatonia as result of corticosteroids therapy. This defined her condition as corticosteroids induced psychosis as per DSM -5 criteria [12].

During her admissions prednisolone dose was reduced to 40 mg daily at first then to 30mg daily then to 30mg alternate day and then to 20 mg and 10 mg and discontinued. The aim was to taper prednisolone slowly. She was commenced with immunosuppressive drugs TACROLIMUS 2mg per oral twice a day as alternative for prednisolone. For to settle psychiatric presentation, she was prescribed with QUETIAPINE 25mg peroral HS with additional one dose in SOS and tablet Lorazepam 1 mg peroral twice a day. In addition, she was commenced with proton pump inhibitors, calcium (200g), vitamin D, Levothyroxine (25 mcg) for hypothyroidism and Enalapril (ACE inhibitors) 5mg.

A repeat psychiatric consultation was done which reported improvement on her behavior, sleep duration and appetite.

Before discharge, her blood investigation and urinalysis were repeated (Table 1) which shows improvement on her condition. Urine dipstick test showed three plus (3+) level of protein initially which later decreased to two plus (2+).

This illustrates that prednisolone induced psychosis following treatment of nephrotic syndrome can be prevented with alternative drug like Tacrolimus, an immunosuppressive drugs.

3. Discussion

Corticosteroids is being used for nephrotic syndrome in children and children often experience serious problem with high dose prednisolone therapy like depression, anxiety, fearfulness, increased aggression and low performance in school [2,3].

The major risk factors for steroids induced psychosis are female gender, previous history of psychosis in past, long term consumption of steroids and dose of steroids more than 40mg/day [2,4]. In our case, three of the above-mentioned risk factors (female, long term

Table 1

Laboratory findings.

Investigation	BLOOD CHEMISTRY	At the time of presentation	After 5 week	At the time of discharge.
Sodium		134.50 mmol/L	137 mmol/L	136.5mmol/L
Potassium		3.80mmol/L	3.4mmol/L	3.6mmol/L
Urea		34.03mg/dL	23.5mg/dl	22.6mg/dl
Creatinine		0.36mg/dL	0.4mg/dl	0.4mg/dl
Serum protein		4.8 g/dL	5.1 g/dl	5.8 g/dl
Serum albumin		1.33g/dl	1.37g/dl	3.6g/dl
Serum globulin		3.1g/dl	3.8g/dl	3.5g/dl
LIVER FUNCTION TESTS				
Bilirubin (total)		0.5 mg/dl	0.1mg/dl	
Direct bilirubin		131.4U/L		
Alkaline phosphatase		31.4U/L		
Aspartate transaminase		18.8U/L		
Alanine transaminase				
FULL BLOOD COUNTS				
Hemoglobin		13.5 gm/dl	14.5 gm/dl	14 gm/dl
PCV		45%	44.5%	44%
Total leucocytes count		10400 cell/mm	10700 cell/mm	10400 cell/mm
Differential Leucocytes Count		85%	88%	
Neutrophils		13%	10%	
Lymphocytes		02%	02%	
Monocytes				
Platelets count		130000 cell/mm	124000 cell/mm	140000 cell/mm
URINE RE/ME				
Protein		3+	3+	2+
Sugar		NEGATIVE	NEGATIVE	NEGATIVE
WBC		1-2/HPF	1-3/HPF	1-3/HPF
RBC		NOT SEEN	NOT SEEN	NOT SEEN
Epithelial cells		0-1/HPF	0-1/HPF	0-1/HPF

administration of steroid and dose more than 40 mg per day) were present. Similar report was found in article of Herguner S et al. [2].

The incidence of steroids induced psychosis in nephrotic patients is higher than other diseases treated with corticosteroids (like chronic obstructive pulmonary disease) because of low serum albumin level in nephrotic patients as compare to other disease. The reason behind it is that synthetic steroids binds to serum albumin and become inactive. But if there is low albumin level in serum then there will be higher level of free and active fraction of steroids thus exposing patients to more adverse effects like psychosis [2,5].

In our case also there was low albumin level while she had presented with psychosis symptoms and after the remission of abnormal behavior and feature of psychosis, her albumin level came back to normal state. From this finding, we can say that low level of albumin is favorable situation on getting adverse effects of steroids therapy in the form of psychosis.

For the management of steroids induced psychosis, we tapered the dose of Prednisolone with continuation of immunosuppressive drugs (Tacrolimus) and antipsychotics drug (Quetiapine) similar to the case reported by Anyabolu, E. N. et [6] where Risperidone is used as antipsychotic and Azathioprine as immunosuppressive. In a case reported by Hergüner, S et al. [2], there is continuation of corticosteroids for to prevent relapse of nephrotic syndrome in future. In several cases, antipsychotics drugs like Haloperidol [8], Chlorpromazine [9] and Risperidone [10] were offered for the treatment of steroids induced psychosis. In our case we have used Quetiapine as an antipsychotic drugs for the management of steroids induced psychosis.

As many literature review suggest a rapid onset of psychiatric side effects after commencement of megadoses of steroids at the initial phase of treatment of nephrotic syndrome [2,7]. Thus the patients should also be seen soon, preferably within a week. The observation should include the monitoring of body weight, blood glucose, blood pressure and patient should be asked about mood swings and symptoms of depression and mania. In the case of children, parents should be made aware about the child's behavior, cognitive and affective changes [2]. From this, we can detect early phase of adverse effects of steroids on a child with nephrotic syndrome. A case report by Herguner S et al. [2] has mentioned that atypical antipsychotics drug like Risperidone may be considered as a prophylactic agent for a child who develop behavior changes during corticosteroids treatment and psychotic reaction should be taken into account as a possibility.

4. Conclusion

To our knowledge, this is the first case reported from Nepal, though the prevalence of steroids induced psychosis in our locality is higher. Lack of planned follow up and proper counselling to parents about the adverse effects of steroids therapy are the major cause for steroids induced psychosis. Early detection with intervention will surely prevent Nepalese children from getting this illness.

Patient consent

Written informed consent was obtained from the father of the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Ethical approval

Ethical approval is not required for case report.

Sources of funding for your research

Since we are medical students under supervision, we don't have any financial support for our research.

Consent

Written informed consent was obtained from one of the parent(father) for publication of this case report and accompanying images. A copy of written consent is available for review by the editor-in-chief of this journal on request. We also ensure, none of the identifying characteristics are included in the case report.

Author contribution

First Amrit Bhusal literature review, follow-up the patient, writing the manuscript, and final approval of the manuscript Second Dr. Silan Bhandari literature review, follow-up the patient, writing the manuscript, and final approval of the manuscript Third Sagar Pokhrel literature review and final approval of the manuscript Fourth Dr. Shankar Prasad Yadav Supervisor, literature review, treating physician of the patient and final approval of the manuscript.

Registration of research studies

1. Name of the registry:
2. Unique Identifying number or registration ID:
3. Hyperlink to your specific registration (must be publicly accessible and will be checked).

Guarantor

Amrit Bhusal is the Guarantor.

Provenance and peer review

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Declaration of competing interest

None.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.amsu.2022.104515>.

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