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RESEARCH ARTICLE

ASSESSMENT OF INFLUENZA VACCINATION STATUS IN CHILDREN WITH NEPHROTIC SYNDROME

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Abstract

Background: Nephrotic syndrome (NS) is a common kidney disease in childhood. Children with this condition are at higher risk of developing vaccine-preventable diseases. Prednisolone remains the mainstay for the treatment of NS. Giving influenza vaccination to NS children will significantly lower the risk of NS relapse during the post-vaccination period.

Aims and Objectives: To assess the influenza vaccination status in children with nephrotic syndrome.

Materials and Methods: Parents/guardians of 69 pediatric patients (<18 years old) diagnosed with NS from February 2022 to January 2023 were surveyed to evaluate influenza immunization status and parental knowledge regarding flu vaccination recommendations.

Results: Among 69 patients included in the study, 7 children (10.1%) were vaccinated with inactivated influenza vaccine. Among the 62 parents of unvaccinated children, 21 (33.9%) had concerns about the safety of influenza vaccination, 18 (29%) had concerns about the cost of such vaccine, 17 (27.4%) were not aware of the proper recommendations and 6 (9.7%) had been told by their neighbors and relatives not to vaccinate with such vaccine.

Conclusions: Physicians must be aware that proper information oninfluenza vaccination recommendations must be provided to family members along with the safety and efficacy profile of the vaccine for successful influenza vaccination in childhood nephrotic syndrome.

Introduction:-

Nephrotic syndrome is characterized by edema, heavy proteinuria (defined by urinary protein excretion >1 g/m2/day ;>40 mg/m2/hr),and hypoalbuminemia (serum albumin <3 g/dl). NS has an annual incidence of 1.2 to 16.9 per 100,000 children. [1,2]Most cases of NS (85-90%)are primary or idiopathic and responded well to oral glucocorticoids. These types of cases are called steroid-sensitive nephrotic syndrome (SSNS). Though the course of SSNS is satisfactory, however in approximately 50% of cases the disease shows frequent relapses (FRNS) or steroid dependence (SDNS), and around 3-10% of cases show late steroid resistance (SRNS). [3] Due to the immunological

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effects of the disease and concurrent prolongedtreatment withglucocorticoid, children with NS are at high risk of developing infections with bacteria and viruses. They are at higher risk of developing vaccine-preventable diseases. Ongoing treatment of NS may delay the timing of different vaccines. It is seen thatchildren who got annual vaccination with the influenza vaccine hada significantly lower incidence of developing flu infection and relapse of NS relapse in comparison with unvaccinated children. [4]

Aims and Objectives:-

The present study will assess influenza vaccination status in children with nephrotic syndrome.

Material and Methods:-

The study was conducted at the Pediatric Nephrology outpatient department of the College of Medicine and JNM Hospital, Kalyani, Nadia, West Bengal after taking permission from Institutional Ethical Committee. Pediatric patients (<18 years old) with NSwere included in the study. A total of 69 patients' parents/guardianswere included within a timespan of February 2022 to January 2023, 1 year. After taking consent from the patient's family members, a survey was conducted regarding the influenza vaccination status of their NS children and knowledge regarding the vaccination recommendation of such children. Data was collected and Statistical analysis was done using Microsoft excel 2016.

Results:-

The detailed characteristics of our findings from this study are depicted in Table 1.1, Table 1.2, and Figure 1.

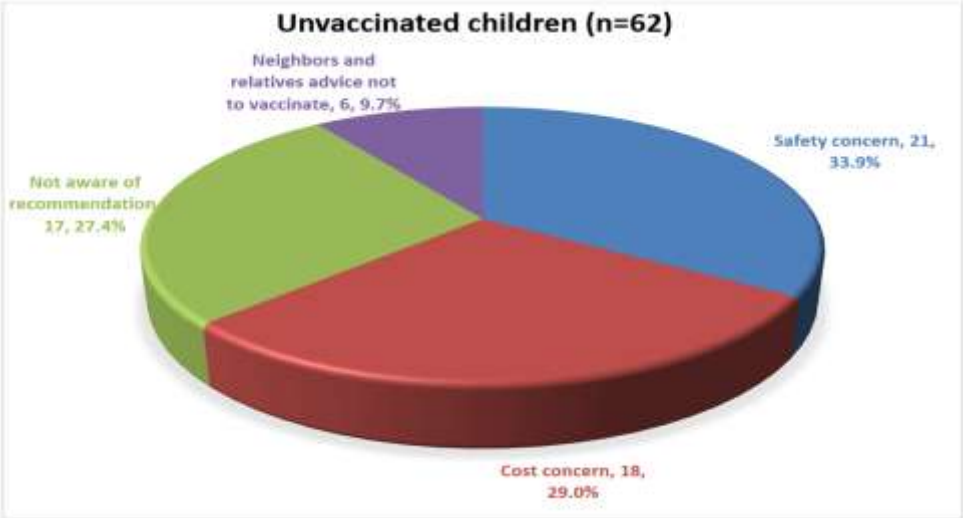
Table 1.1:- Gender distribution among vaccinated and unvaccinated NS Children.

Parameters	Number (n=69)	Vaccinated	Unvaccinated
Gender • Male • Female	 42 (60.9%) 27 (39.1%)	 5 2	 37 25

Table 1.2:- Reason for not giving influenza vaccine to NS children.

Reason	Total unvaccinated (n=62)	Percentage
Safety concern	21	33.9%
Cost concern	18	29%
Not aware of the recommendation	17	27.4%
Neighbors and relatives advise not to vaccinate	6	9.7%

Figure 1:- Flu Unvaccinated NS children.



Out of the 69 patients, 42 (60.9 %) were boys and 27 (39.1 %) were girls. The sex ratio (M/F) was 1.5:1.Mean age at presentation was 24.4 months. We found that 7 children (10.1%) were vaccinated against inactivated influenza vaccine. Among the 62 parents of unvaccinated children, 21 (33.9%) had concerns about the vaccine's safety, 18 (29%) had concerns about the cost of the vaccine, 17 (27.4%) were not aware of the recommendations, 6 (9.7%) had been told by their neighbors and relatives not to vaccinate with the such vaccine. We found two children (2.9%) had been vaccinated annually with inactivated influenza vaccine in the years preceding the study.

At the end of the survey, the parents/guardians were informed of the proper recommendation forthe influenza vaccine. The safety and efficacy of the vaccine were discussed with the family members and 31 (44.9%) parents showed positive interest in giving the flu vaccine to their children with NS. However, 20 (29%) others stated that they will consult another physician before giving the vaccine. 18 parents (26.1%) stated that they would still refuse to vaccinate their children for the next seasons.

Discussion:-

Relapse of NS may occur following infection with viruses, including influenza virus, rhinovirus, respiratory syncytial,etc. [5]Children younger than 5 years with chronic kidney disease like NS are at increased risk of hospitalization and complications from influenza virus infection. [6]

Influenza virus infection is an important cause of Lower respiratory tract infections (LRTI) including pneumonia that may lead to severe disease in children less than 5 years of age leading to mortality and morbidity. [7]Approximately 1 in 5 unvaccinated children less than 18 years of age are annually infected by seasonal influenza, of which one-half of the cases are symptomatic [8]. As the risk of morbidity and mortality is high in immunosuppressed children, annual administration of the inactivated influenza vaccine is recommended for patients with NS, and their household contacts and caregivers [6,9].

A study conducted by Klifa et al. [10] showed, out of the 57 children with NS, only 14 children (24.6%) were vaccinated with the influenza vaccine. Out of the 43 (39.5%) parents of unvaccinated children, the major concern was the safety of the vaccine followed by not being aware of the flu vaccine recommendations in 16 cases. In our study, we found safety concerns in 21 (33.9%) cases. However, in our study, we have 18 (29%) cases where vaccination cost was the factor. This is a new finding in comparison to Western Countries. Another important thing in our study is that parents are to some extent influenced by their neighbors and relatives and NS children were not vaccinated in 6 cases (9.7%) as relatives told them not to vaccinate the child.

Parents'mistrust of vaccination of their children is a global issue. Vaccine hesitancy can be related to multiple issues including confidence, convenience, and complacency. [11, 12] We showed that 21 (33.9%) parents of unvaccinated children had safety concerns about the influenza vaccine despite the recommendations.We also showed that even after a discussion about recommendations, safety, efficacy, and surrounding misinformation regardingthe flu vaccine, 31 (44.9%) parents showed positive interest in giving the flu vaccine to their children with NS in the next season. However, 20 (29%) others said that they will consult another physician before giving theinfluenza vaccine. 18 parents (26.1%) stated that they would still refuse to vaccinate their NS children for the next seasons.

A study by Tran et al.[13] showed out of 153 parents/guardians of NS children, 13% indicated that no one told them when it was acceptable to receive inactive immunizations. Overall, 32% of parents/guardians' responses suggested that they understood immunization practices for inactive vaccines. There was no issue of cost in that study. Our study indicates, out of 69 parents/guardians, 17 (27.4%) were not aware of the recommendations and 18 (29%) had concerns about the cost of the vaccine.

Conclusions:-

The present study identifies that treating physicians must provide adequate information on influenza vaccination recommendationsto parents/guardians of NS children along with the safety and efficacy profile of the vaccine for successful influenza vaccination in childhood nephrotic syndrome. This study also indicates thatthe cost of the vaccine is also an issue in our locality.

Authors Contribution:
MM- Concept, design of the study, manuscript preparation; BT, AD, CB- Statistical analysis, Interpreted the results; reviewed the literature; NB, CB- Manuscript preparation and drafting, Revision of draft

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None declared.

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