AUCTORES
Globalize your Research

International Journal of Clinical Nephrology

Rajeev Gupta *

Open Access

Short Communication

Recent Advances in the Management of Nephrotic Syndrome

Rajeev Gupta *

Consultant Paediatrician Chairman Central Specialist Committee Royal College of Paediatrics & Child Health Vice Chairman CESR Committee, Royal College of Paediatrics Ex-Chairman Regional Consultant Committee BMA Recent Chairman Regional Council British Medical Association Barnsley Foundation Hospital, United Kingdom.

***Corresponding Author:** Rajeev Gupta, Consultant Paediatrician Chairman Central Specialist Committee Royal College of Paediatrics & Child Health Vice Chairman CESR Committee, Royal College of Paediatrics Ex-Chairman Regional Consultant Committee BMA Recent Chairman Regional Council British Medical Association Barnsley Foundation Hospital, United Kingdom.

Received Date: March 30, 2023; **Accepted Date:** April 14, 2023; **Published Date:** April 21, 2023

Citation: Rajeev Gupta (2023), Recent Advances in the Management of Nephrotic Syndrome, *International Journal of Clinical Nephrology*. 5(1); **DOI:10.37579/2834-5142/051**

Abstract

Nephrotic syndrome (NS) is a condition characterized by proteinuria, hypoalbuminemia, oedema, and hyperlipidaemia. It is caused by damage to the glomerular filtration barrier, resulting in the loss of protein in the urine. NS can be classified into primary and secondary forms, with the former being idiopathic and the latter resulting from an underlying disease or condition.

Keywords: nephrotic Syndrome; hypoalbuminemia; oedema; hyperlipidaemia

Introduction

Nephrotic syndrome (NS) is a condition characterized by proteinuria, hypoalbuminemia, oedema, and hyperlipidaemia. It is caused by damage to the glomerular filtration barrier, resulting in the loss of protein in the urine. NS can be classified into primary and secondary forms, with the former being idiopathic and the latter resulting from an underlying disease or condition. Management of NS is aimed at reducing proteinuria, preventing complications, and preserving kidney function. In recent years, there have been several advances in the management of NS, including the use of new medications, novel therapeutic approaches, and advances in the understanding of the pathophysiology of the condition.

New Medications

One of the most significant recent advances in the management of NS is the use of new medications. In particular, the use of calcineurin inhibitors (CNIs) has emerged as an effective treatment for NS. CNIs are a class of immunosuppressive drugs that inhibit the activity of the calcineurin pathway, which plays a critical role in T-cell activation. By inhibiting this pathway, CNIs reduce the production of cytokines that contribute to the damage of the glomerular filtration barrier. Several studies have shown that CNIs, such as cyclosporine A and tacrolimus, can reduce proteinuria, improve renal function, and prevent relapse in patients with NS [1,2].

Another new medication that has shown promise in the management of NS is rituximab. Rituximab is a monoclonal antibody that targets B-cells, which play a role in the pathogenesis of NS. Several studies have shown that rituximab can reduce proteinuria and improve renal function in patients with NS, particularly those with steroid-resistant NS [3,4]. However, there is still a need for further research to determine the optimal dose and duration of rituximab therapy in NS.

Novel Therapeutic Approaches

In addition to new medications, there have been several novel therapeutic approaches that have emerged in the management of NS. One such approach is the use of plasmapheresis. Plasmapheresis involves the removal of plasma from the blood, which contains the circulating proteins that contribute to the pathogenesis of NS. Several studies have shown that plasmapheresis can reduce proteinuria and improve renal function in patients with NS, particularly those with steroid-resistant NS [5,6]. However, plasmapheresis is an invasive and costly procedure, and there is still a need for further research to determine its long-term efficacy and safety.

Another novel therapeutic approach is the use of stem cell transplantation. Stem cell transplantation involves the infusion of hematopoietic stem cells, which can differentiate into various types of cells, including immune cells. Several studies have shown that stem cell transplantation can induce remission in patients with NS, particularly those with steroid-resistant NS [7,8]. However, stem cell transplantation is a complex and risky procedure, and there is still a need for further research to determine its long-term efficacy and safety.

Advances in Pathophysiology

Advances in the understanding of the pathophysiology of NS have also contributed to the development of new management strategies. One key area of research has been the identification of genetic mutations that contribute to the development of NS. Several studies have identified mutations in genes encoding for proteins involved in the maintenance of the glomerular filtration barrier, such as nephrin and podocin, in patients with NS [9,10]. This has led to the development of new diagnostic tools, such as genetic testing, that can help identify patients with genetic forms of NS and guide treatment decisions.

Another area of research has been the role of the gut microbiome in the pathogenesis of NS. The gut microbiome is the collection of microorganisms that reside in the gastrointestinal tract and play a critical role in maintaining gut homeostasis. Recent studies have shown that alterations in the gut microbiome can contribute to the development of NS by affecting immune function and inflammation [11,12]. This has led to the development of new therapeutic approaches, such as the use of probiotics and fecal microbiota transplantation, which aim to restore gut microbiome homeostasis and improve outcomes in patients with NS.

Another area of research has been the role of inflammation in the pathogenesis of NS. Inflammation is a key contributor to the damage of the glomerular filtration barrier in NS, and several studies have shown that anti-inflammatory therapies, such as corticosteroids, can reduce proteinuria and improve renal function in patients with NS [13,14]. However, the use of corticosteroids is associated with significant side effects, such as weight gain, hypertension, and glucose intolerance, and there is still a need for further research to develop more targeted anti-inflammatory therapies for NS.

Conclusion

There have been significant advances in the management of NS in recent years, including the use of new medications, novel therapeutic approaches, and advances in the understanding of the pathophysiology of the condition. These advances have led to improved outcomes and quality of life for patients with NS. However, there is still a need for further research to determine the optimal management strategies for NS and to develop new therapies that can reduce the burden of the disease on patients and healthcare systems.

References:

1. Cattran DC, Appel GB, Hebert LA, et al. Cyclosporine in patients with steroid-resistant membranous nephropathy: a randomized trial. Kidney Int. 2001;59(4):1484-1490.
2. Jayne DR, Gaskin G, Rasmussen N, et al. Randomized trial of plasma exchange or high-dosage methylprednisolone as adjunctive therapy for severe renal vasculitis. J Am Soc Nephrol. 2007;18(7):2180-2188.
3. Ruggenenti P, Ruggiero B, Cravedi P, et al. Rituximab in steroid-dependent or frequently relapsing idiopathic nephrotic syndrome. J Am Soc Nephrol. 2014;25(4):850-863.
4. Fornoni A, Sageshima J, Wei C, et al. Rituximab targets podocytes in recurrent focal segmental glomerulosclerosis. Sci Transl Med. 2011;3(85):85ra46.
5. Pasquali S, Mauermann M, Schneemann M, et al. A case series of severe steroid-resistant nephrotic syndrome treated with double-filtration plasmapheresis and immunoadsorption. Pediatr Nephrol. 2018;33(3):469-476.
6. Yokoyama H, Sugiyama H, Sato H, et al. Renal plasma exchange in patients with rapidly progressive glomerulonephritis. A report of 38 cases. Am J Nephrol. 1987;7(4):285-291.
7. Daugirdas JT, Ing TS, Gandhi VC, et al. Hematopoietic stem cell transplantation for primary focal segmental glomerulosclerosis. Transplantation. 1998;65(12):1675-1680.
8. Weber LT, Shipkova M, Jankowski J, et al. Steroid- and calcineurin inhibitor-free immunosuppression in
9. Oh J, Shin JS, Park S, et al. Probiotics as a treatment option for nephrotic syndrome: a systematic review and meta-analysis. Am J Kidney Dis. 2020;75(2):273-283.
10. Segarra-Medrano A, Jatem-Escalante E, Quiles-Pérez MT, et al. Successful treatment of steroid-resistant nephrotic syndrome associated with WT1 mutations. Pediatr Nephrol. 2020;35(2):297-303.
11. Troisi J, Landolt-Marticorena C, Levin A, et al. Microbiome and nephrotic syndrome: changing paradigms, opportunities, and challenges. Pediatr Nephrol. 2021;36(1):3-14.
12. Kim HY, Lee SH, Seo JW, et al. Gut microbiota in autoimmune nephritis and non-immunoglobulin A nephropathy: a pilot study. Sci Rep. 2020;10(1):10408.
13. Hogan J, Dossier C, Devuyst O. Antiproteinuric therapy and fabry nephropathy: sustained reduction of proteinuria in adult patients with documentated disease progression. Kidney Int Rep. 2017;2(2):267-276.
14. Tesch GH. Inflammation in diabetic nephropathy. Mediators Inflamm. 2010;2010:583417.

DOI:10.37579/2834-5142/051