Editorial
Volume 4:4, 2021

Journal of
Clinical Neurology and Neurosurgery

Open Access

Apheresis in the Treatment of Neurological Disorders

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Editorial

Plasma Exchange (PE) and Immunoadsorption (IA) are key therapeutic options for autoimmune diseases in a variety of medical fields. Their pathophysiological reasoning is primarily based on the elimination of autoantibodies and a favourable immune system regulation. From a theoretical standpoint, apheresis is a promising treatment approach since it works by removing pathogenic components rather than giving medicines that can have serious adverse effects. Multiple Sclerosis (MS) steroid-refractory relapse, myasthenia gravis, Autoimmune Encephalitis (AE), Guillain Barre Syndrome (GBS), and Chronic Inflammatory Demyelinating Polyneuropathy (CIDP) are among the neurological indications. Although PE and IA are frequently used in clinical practise, evidence for their efficacy and safety in the aforementioned indications is generally lacking. This is due to the fact that drugs and medical devices are treated differently in terms of regulatory approvals in most countries, that is indication-specific phase III studies are generally not required in order to gain approval. As a result, less is known regarding the efficacy of PE and IA in comparison to other treatment choices and to each other. Similarly, there is a complete dearth of understanding regarding the best treatment regimens for PE and IA.

Differences in Methodology between Plasma Exchange and Immunoadsorption: Although both PE and IA are primarily focused on removing autoantibodies from the blood, it's important to remember that both methods imply additional immune-modulating mechanisms, such as up- and down regulation of anti- inflammatory and pro-inflammatory proteins and possibly other alterations that have yet to be discovered. While PE removes all proteins from the plasma and replaces them with human albumin or fresh frozen plasma, IA is more selective, removing just immunoglobulins and leaving the rest of the plasma intact. Since a result, IA should potentially be a low risk option to PE, as the preservation of coagulation factors should indicate less bleeding problems, and since no volume replacement solution is required, a reduced risk of allergic responses should be predicted. For many purposes, however, evidence for efficacy for IA is even lower than for PE, which does not necessarily suggest inferiority to PE, but might simply be explained by the fact that IA is the newest technique, and hence fewer clinical studies have been conducted. Furthermore, the retention of some pro-inflammatory proteins may reduce the efficacy of IA when compared to PE, which is a problem in autoimmune disorders like MS and CIDP, where unique disease related auto-antibodies have not been identified in the majority of patients. Therapeutic decisions are exclusively based on the results of clinical trials comparing alternative treatment options as long as the immunological processes underlying both illnesses and therapies are not completely understood.

How to cite this article: Hazel Scarlett. "Apheresis in the Treatment of Neurological Disorders". *J Clin Neurol Neurosurg* 4 (2021): 124

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Received: 02 July, 2021; **Accepted:** 17 July, 2021; **Published:** 24 July, 2021