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COMPARISON OF THE EFFICACY OF PLASMAPHERESIS AND INTRAVENOUS IMMUNOGLOBULIN IN INFLAMMATORY NEUROPATHIES: A LITERATURE REVIEW

Lena Jaworowicz *(Corresponding Author, Email: lena.jaworowicz@gmail.com)*
Independent Public Central Clinical Hospital in Warsaw, Warsaw, Poland
ORCID ID: 0009-0008-4210-7216

Maria Wieczorek
Medical University of Warsaw, Warsaw, Poland
ORCID ID: 0009-0000-9951-7509

Weronika Plichtowicz-Kordowska
Medical University of Warsaw, Warsaw, Poland
ORCID ID: 0009-0009-7713-8597

Aleksandra Stępka
Medical University of Warsaw, Warsaw, Poland
ORCID ID: 0009-0007-5034-0037

Agnieszka Jóźwicka
Medical University of Warsaw, Warsaw, Poland
ORCID ID: 0009-0008-1130-1518

Karina Lewandowska
Medical University of Warsaw, Warsaw, Poland
ORCID ID: 0009-0004-5298-1426

Ewa Bąkowska
Medical University of Lublin, Lublin, Poland
ORCID ID: 0009-0007-4135-9748

Wojciech Janikowski
Medical University of Warsaw, Warsaw, Poland
ORCID ID: 0009-0008-4078-9698

ABSTRACT

Inflammatory neuropathies, including Guillain-Barré syndrome (GBS), chronic inflammatory demyelinating polyradiculoneuropathy (CIDP), and multifocal motor neuropathy (MMN) are immune-mediated disorders in which immunomodulatory therapy constitutes the cornerstone of treatment. Therapeutic plasma exchange (TPE) and intravenous immunoglobulin (IVIG) represent the two principal disease-modifying strategies. Although both modalities have demonstrated clinical efficacy, their mechanisms of action, safety profiles, durability of response, and logistical implications differ substantially.

This review provides a structured comparative analysis of TPE and IVIG across major inflammatory neuropathies, synthesizing evidence from randomized controlled trials, meta-analyses, and international guidelines. In acute GBS, high-quality evidence supports broadly equivalent efficacy between TPE and IVIG in improving disability scores, reducing time to independent ambulation, and shortening mechanical ventilation duration. In CIDP, IVIG is strongly supported for both induction and maintenance therapy, whereas TPE is primarily used for short-term improvement or refractory disease. In MMN, IVIG remains the established first-line therapy, with plasma exchange demonstrating limited benefit.

Safety considerations differ between modalities: IVIG is associated mainly with systemic infusion-related and thrombotic risks, whereas TPE carries procedural and vascular access-related complications. Logistical feasibility, infrastructure availability, cost structure, and global immunoglobulin supply constraints further influence therapeutic selection.

Despite established efficacy, gaps remain regarding optimal sequencing strategies, long-term comparative outcomes, and biomarker-guided therapy selection. Future prospective and stratified studies are required to refine individualized treatment algorithms and optimize long-term patient outcomes in immune-mediated neuropathies.

KEYWORDS

Plasmapheresis, Intravenous Immunoglobulin (IVIG), Guillain-Barré Syndrome, Chronic Inflammatory Demyelinating Polyneuropathy (CIDP), Multifocal Motor Neuropathy (MMN)

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Introduction

Inflammatory neuropathies comprise a heterogeneous group of immune-mediated disorders affecting the peripheral nervous system and resulting in progressive motor and sensory dysfunction. Clinical manifestations vary according to disease subtype but typically include limb weakness, hyporeflexia or areflexia, sensory disturbances, and in severe cases cranial nerve involvement or respiratory failure requiring mechanical ventilation [1,2].

Guillain-Barré syndrome (GBS) is the prototypical acute immune-mediated polyradiculoneuropathy characterized by rapidly progressive symmetrical weakness reaching nadir within four weeks and frequently preceded by infection. Immunopathogenesis is largely antibody-mediated, involving antiganglioside antibodies and complement activation at the level of peripheral nerves [1-3]. The global incidence of GBS is estimated at approximately 1-2 cases per 100,000 persons annually [1,3].

Chronic inflammatory demyelinating polyradiculoneuropathy (CIDP) represents the chronic counterpart of immune-mediated demyelinating neuropathy and follows a relapsing or progressive course beyond eight weeks [4]. Epidemiological studies estimate CIDP prevalence between 0.3 and 3 per 100,000 individuals [4,8].

Multifocal motor neuropathy (MMN) is characterized by asymmetric distal limb weakness, conduction block and frequent association with anti-GM1 antibodies [6,7].

The immunopathogenesis of inflammatory neuropathies involves complex interactions between humoral and cellular immune mechanisms [3,4,8].

Two principal immunomodulatory treatment strategies are currently used in clinical practice: therapeutic plasma exchange (TPE) and intravenous immunoglobulin (IVIG) [9,10]. Randomized controlled trials and systematic reviews have established both TPE and IVIG as effective treatments in acute GBS [9,11]. In CIDP, IVIG and corticosteroids are typically recommended as first-line therapies [4,10], while in MMN, IVIG has demonstrated clear superiority [6,7].

Methodology

This narrative review was conducted using a structured literature search strategy to identify relevant studies evaluating the efficacy and safety of therapeutic plasma exchange (TPE) and intravenous immunoglobulin (IVIG) in inflammatory neuropathies. Electronic databases including PubMed/MEDLINE and the Cochrane Library were systematically searched for publications between 1990 and 2025.

Search terms included combinations of the following keywords and Medical Subject Headings (MeSH): “plasmapheresis”, “plasma exchange”, “therapeutic plasma exchange”, “intravenous immunoglobulin”, “IVIG”, “Guillain-Barré syndrome”, “chronic inflammatory demyelinating polyradiculoneuropathy”, “CIDP”, “multifocal motor neuropathy” and “MMN”.

Priority was given to randomized controlled trials, systematic reviews, meta-analyses, and international clinical practice guidelines. Observational studies were included when randomized evidence was limited, particularly in MMN and long-term CIDP maintenance therapy. Case reports and small uncontrolled series were excluded unless they addressed emerging biomarkers or safety considerations.

Guideline documents from the European Academy of Neurology (EAN), Peripheral Nerve Society (PNS) and American Academy of Neurology (AAN) were reviewed. Only full-text articles published in English were included. Animal studies were excluded.

This work represents a structured narrative synthesis and does not include formal quantitative meta-analytic pooling of data. The objective was to critically compare mechanistic rationale, clinical efficacy, safety profiles and practical considerations relevant to therapeutic decision-making between TPE and IVIG.

Biological Mechanisms and Rationale

Therapeutic Plasma Exchange (TPE)

Therapeutic plasma exchange (TPE), also referred to as plasmapheresis, is an extracorporeal blood purification technique designed to remove circulating plasma components, including autoantibodies, immune complexes, complement proteins and proinflammatory cytokines [14-16].

In antibody-mediated neuropathies such as Guillain-Barré syndrome and selected forms of multifocal motor neuropathy, rapid reduction of pathogenic circulating factors may attenuate ongoing immune-mediated nerve injury [2,3,6].

TPE exerts an immediate effect on circulating humoral mediators but does not directly suppress antibody production or broader cellular immune activation beyond removal of soluble factors [12,13]. Standard regimens in GBS typically consist of four to six exchanges administered over 1-2 weeks [11,12]. Because TPE does not inhibit ongoing autoantibody synthesis, its benefit in chronic immune-mediated neuropathies such as CIDP may be transient unless maintenance exchanges are performed [13,14].

Intravenous Immunoglobulin (IVIG)

Intravenous immunoglobulin consists of pooled polyclonal IgG derived from human plasma and administered at immunomodulatory doses, most commonly 2g/kg divided over 2-5 days in acute inflammatory neuropathies [10,11].

The mechanisms of action of IVIG are multifactorial and include Fc receptor blockade on macrophages, modulation of complement activation, neutralization of pathogenic autoantibodies through anti-idiotypic antibodies, regulation of B-cell and T-cell responses, and expansion of regulatory T-cell populations [15-17]. IVIG also influences cytokine networks and dendritic cell maturation, thereby reducing complement-mediated nerve injury [16,17].

Unlike TPE, IVIG does not remove circulating antibodies but counteracts their pathogenic effects and induces broader immunoregulatory changes [16,18].

Clinical improvement in acute GBS often occurs within days of administration [3,10]. Due to its immunomodulatory durability, IVIG is suitable both for single-course therapy in acute syndromes and for long-term maintenance treatment in chronic conditions such as CIDP and MMN [6,19,20].

Comparative Mechanistic Consideration

TPE represents the most rapid method for reducing circulating autoantibody burden [11-12]. In syndromes characterized by high levels of pathogenic antibodies, such as acute GBS, this may facilitate faster biological clearance [2,3]. In contrast, IVIG exerts broader downstream immunomodulatory effects that influence multiple immune pathways [15-17]. These mechanisms may provide greater durability of response in chronic immune-mediated neuropathies [6,8]. Although combination therapy is biologically plausible, clinical evidence has not demonstrated consistent additional benefit compared with monotherapy [11,14]. Sequential therapy may reduce IVIG efficacy if plasma exchange is performed shortly after infusion [12,13]. Current guidelines therefore advise against routine combined therapy outside selected refractory cases [4,11].

Evidence of Efficacy in Guillain-Barré Syndrome

Guillain-Barré Syndrome (GBS) is the inflammatory neuropathy with the most robust comparative evidence regarding therapeutic plasma exchange (TPE) and intravenous immunoglobulin (IVIG) [1-3]. As an acute immune-mediated polyradiculoneuropathy characterized by rapidly progressive weakness and potential respiratory failure, GBS requires prompt immunomodulatory intervention.

Randomized Controlled Trials

Early randomized controlled trials established plasma exchange as an effective treatment for GBS, demonstrating faster recovery and improvement functional outcomes compared with supportive care alone [11].

The landmark randomized trial by van der Meché and Schmitz demonstrated comparable efficacy between IVIG and plasma exchange in terms of disability improvement and time to recovery [9]. Subsequent randomized studies confirmed outcomes regarding time to unaided waling and duration of mechanical ventilation [10,11].

A Cochrane review concluded that IVIG initiated within two weeks of symptom onset as as effective as plasma exchange in hastening recovery [11].

More recent systematic reviews and meta-analyses continue to support therapeutic equivalence and duration od hospitalization [21]. A 2024 review likewise reported no statistically significant superiority of either treatment [22].

Clinical Outcomes and Effect Size

Clinical efficacy in GBS is typically evaluated using improvement in disability scale, time to independent ambulation, duration of mechanical ventilation and mortality [10,11]. Both TPE and IVIG significantly reduce short-term disability compared with supportive care alone [11]. Treatment effectiveness is strongly time dependent, with earlier initiation associated with improved outcomes [2,3]. Direct comparisons indicate no clinically meaningful differences in long-term functional recovery [9,10]. Some studies suggest that TPE may result in slightly faster early improvement in severely affected or ventilated patients [11,23].

Treatment Related Fluctuations and Retreatment

A subset of patients experiences treatment-related fluctuations following initial improvement [22,23]. Management strategies vary and may include repeat IVIG courses or rescue plasma exchange, although high-quality evidence supporting retreatment remains limited [23,24]. Sequential use of TPE shortly after IVIG may remove administered immunoglobulins, potentially reducing therapeutic effect [12,13]. For this reason, major guidelines discourage routine combination therapy [4,11].

Severe and Ventilated GBS

In patients requiring mechanical ventilation both TPE and IVIG accelerate recovery and may reduce duration of ventilatory support [10,11]. Although some data suggest more rapid early improvement with TPE in severe cases [11], contemporary meta-analyses do not demonstrate consistent long-term superiority [21,22].

Guideline Recommendations

International guidelines recognize both TPE and IVIG as first-line therapies in GBS [4,11]. Treatment should ideally be initiated within two weeks of symptom onset in non-ambulatory patients [11]. Either IVIG (2g/kg over 2-5 days) or plasma exchange 94-6 exchanges over 1-2 weeks) may be used as initial therapy [4,11].

Chronic Inflammatory Demyelinating Polyradiculoneuropathy (CIDP)

Chronic Inflammatory Demyelinating Polyradiculoneuropathy (CIDP) is a chronic immune-mediated neuropathy characterized by progressive or relapsing weakness and electrophysiological evidence of demyelination [4,8]. Unlike GBS, CIDP requires long-term immunomodulatory therapy aimed at sustaining remission and preventing relapse.

Evidence for Intravenous Immunoglobulin

IVIG is one of the most extensively studied first-line therapies in CIDP [4,6]. Randomized controlled trials have demonstrated significant improvement in muscle strength and disability scores compared with placebo [19,25].

A Cochrane review confirmed that IVIG improves short-term disability and functional outcomes in CIDP [3].

Long-term extension studies indicate that many patients require maintenance therapy to sustain benefit [25,26]. Maintenance regimens typically involve repeated infusions administered every 2-6 weeks, individualized according to clinical response [8,25]. Subcutaneous immunoglobulin (SCIG) has demonstrated efficacy in maintaining remission and improving patient convenience [20,26].

Evidence for Therapeutic Plasma Exchange

Therapeutic plasma exchange has demonstrated short-term efficacy in CIDP [14,27]. Randomized trials showed improvement in strength and disability following plasma exchange, however, benefits are often transient [14]. Cochrane analyses confirm short-term improvement but highlight the lack of robust long-term maintenance data [27]. Because CIDP involves ongoing immune activation, repeated exchanges would be required to sustain benefit, limiting long-term practicality [14,27].

Comparative Considerations and Guidelines

The 2021 European Academy of Neurology and Peripheral Nerve Society guidelines recommends IVIG and corticosteroids as first-line therapies in typical CIDP [4]. Corticosteroids remain an alternative induction therapy, although long-term use is associated with systemic adverse effects [28]. Plasma exchange is recommended in patients with inadequate response to IVIG or corticosteroids, or when rapid clinical improvement is required [4,14].

Long-term Outcomes and Biomarkers

CIDP exhibits a heterogeneous clinical course including monophasic, relapsing-remitting, and progressive forms [8]. Long-term outcomes studies indicate that individualized therapy adjustment is often necessary to maintain remission [29]. Emerging data suggest that specific antibody profiles and nodal/paranodal antibodies may predict differential treatment response [30,31].

Multifocal Motor Neuropathy (MMN)

Multifocal motor neuropathy is a chronic immune-mediated neuropathy characterized by asymmetric distal limb weakness, motor conduction block and frequent association with

anti-GM1 IgM antibodies [6,7]. Unlike CIDP, MMN typically spares sensory fibers and follows a slowly progressive course.

Evidence for Intravenous Immunoglobulin

IVIG is the established first-line therapy in MMN and remains the only treatment with consistent evidence of sustained clinical benefit [5,33]. A randomized controlled trial demonstrated significant improvement in muscle strength following IVIG administration compared with placebo [5]. Long-term follow-up studies confirmed that repeated IVIG infusions maintain motor function and slow disease progression [33].

Most patients require maintenance therapy at regular intervals, typically every 2-6 weeks, with dosing individualized according to clinical response [33]. The therapeutic effect is believed to relate to neutralization of anti-GM1 antibodies and modulation of complement-mediated nerve injury [7].

Role of Therapeutic Plasma Exchange

In contrast to GBS and CIDP, plasma exchange has not demonstrated durable clinical benefit in MMN [6]. Available data suggest that removal of circulating antibodies is insufficient to produce sustained improvement, likely due to ongoing antibody production and distinct immunopathological mechanisms [7]. International guidelines consistently endorse IVIG as first-line therapy and do not recommend plasma exchange in routine MMN management [4].

Long-term Management Consideration

Long-term IVIG therapy remains the cornerstone of MMN management [33]. Although alternative immunosuppressive agents have been investigated, none have demonstrated consistent superiority to IVIG [6]. Because MMN frequently affects younger adults and often requires lifelong therapy, treatment burden, infusion logistics and cost considerations are particularly relevant.

Safety Profiles and Contraindications

Both therapeutic plasma exchange (TPE) and intravenous immunoglobulin (IVIG) are generally considered safe when administered in experienced centers. However, their adverse-event profiles differ substantially and frequently influence therapeutic selection.

Safety of Therapeutic Plasma Exchange

Therapeutic plasma exchange is an invasive extracorporeal procedure requiring reliable vascular access and continuous monitoring. Complications may arise from the procedure itself as well as from replacement fluids and anticoagulation. The most common adverse events include vascular-related complications such as bleeding, thrombosis, catheter malfunction, and infection [16,34]. Hypotension may occur during exchange due to intravascular volume shifts, particularly in elderly patients or those with cardiovascular instability [16,34]. Citrate anticoagulation may lead to transient hypocalcemia, sometimes presenting as paresthesia, muscle cramps or mild arrhythmias [34]. When fresh frozen plasma is used as replacement fluid, allergic reactions may occur, although severe reactions are uncommon [34]. Large observational studies confirm that plasma exchange is generally well tolerated when performed by trained personnel under appropriate monitoring conditions [16,34].

Safety of Intravenous Immunoglobulin

Intravenous immunoglobulin is less invasive but associated with systemic adverse effects related to immunoglobulin infusion and hematologic changes.

Infusion-related reactions such as headache, flushing, fever, chills, nausea, and fatigue are relatively common but typically mild and infusion-rate dependent [34,35]. Slower infusion rates and adequate hydration reduce their frequency. More serious but less frequent complications include thromboembolic events, which may result from increased serum viscosity and procoagulant effects [35]. Patients with prior thrombosis, hyperviscosity states, advanced age or cardiovascular disease are at increased risk. Acute kidney injury has been reported, particularly with sucrose-stabilized preparations and in patients with preexisting renal impairment [34,35]. Rare adverse events include hemolysis and aseptic meningitis [35].

Comparative Safety Considerations

Comparative analyses suggest that overall incidence of serious adverse events is broadly similar between TPE and IVIG, however, the nature of complications differs [16,34-36].

TPE carries procedural and vascular access-related risks, whereas IVIG is associated primarily with systemic and thrombotic complications. Consequently, therapeutic selection must incorporate careful assessment of renal function, cardiovascular stability, thrombotic risk profile, venous access quality, instuitional expertise. In hemodynamically unstable patients or those without reliable venous access, IVIG may be preferable [4,14]. Conversely, in patient with significant renal dysfunction or prior severe IVIG-related thrombosis, plasma exchange may represent the safer option [16,32].

Logistical Considerations, Cost-effectiveness, and Accessibility

Although therapeutic plasma exchange (TPE) and intravenous immunoglobulin (IVIG) demonstrate comparable efficacy in several inflammatory neuropathies, real-world therapeutic decisions are frequently shaped by infrastructure, healthcare system capacity, and economic constraints.

Logistical Infrastructure

Administration of IVIG requires access to hospital-based or outpatient infusion facilities with trained medical and nursing personnel. In acute Guillain-Barré syndrome (GBS), IVIG is typically administered over two to five consecutive days at a total dose of 2g/kg [10,14]. In CIDP and MMN, maintenance regimens commonly involve repeated infusions every two to six weeks, individualized according to clinical response [8,25,33]. The availability of subcutaneous immunoglobulin (SCIG) has further improved long-term feasibility and patient autonomy in chronic disorders [20,26].

In contrast, therapeutic plasma exchange requires dedicated apheresis equipment, trained transfusion medicine personnel, and reliable vascular access. Standard regimens in acute GBS typically consist of four to six exchanges over one to two weeks [14,15]. Continuous hemodynamic monitoring and anticoagulation management are required during each session [16,34]. Availability of TPE is therefore largely dependent on tertiary care infrastructure. In smaller institutions or resource-limited settings, IVIG may be more feasible if supply is available [4].

Cost-Effectiveness

Economic comparisons between TPE and IVIG vary significantly depending on national healthcare systems, drug pricing structures and hospital reimbursement models.

IVIG is associated with high acquisition costs, particularly at doses required for acute GBS. However, plasma exchange entails procedural costs, disposable equipment, staffing and potential catheter related management.

A cost-minimization analysis demonstrated that the relative economic advantages of either therapy depends strongly on local pricing and infrastructure capacity [37]. In systems with established apheresis services, plasma exchange may be less costly. In others, IVIG may be economically favorable when shorter hospitalization and reduced procedural burden are considered [37]. Comprehensive health economic analyses incorporating long-term disability outcomes and quality-adjustment life years remain limited.

IVIG Supply Constraints

Because IVIG is derived from pooled human plasma, global supply is dependent on plasma donation rates and complex manufacturing processes [35]. Periodic shortages have been reported internationally, affecting access to treatment for immune-mediated neurological disorders [14]. During supply constraints, prioritization strategies may be implemented, and plasma exchange may serve as a practical alternative [14]. Healthcare systems must therefore integrate supply stability and infrastructure capacity into long-term therapeutic planning.

Patient-Centered Considerations

From the patient perspective, treatment burden differs substantially between modalities. IVIG can often be delivered in outpatient settings and, in some cases, at home (particularly SCIG) [20,26]. Plasma exchange typically requires hospital-based sessions and vascular access procedures. In chronic disorders requiring long-term therapy, convenience and quality of life become major determinants of therapeutic preference.

Clinical Decision-Making: When to Choose TPE versus IVIG

Given the broadly comparable efficacy of therapeutic plasma exchange (TPE) and intravenous immunoglobulin (IVIG) in several inflammatory neuropathies, therapeutic selection must be individualized rather than strictly algorithm driven.

Guillain-Barré Syndrome

In acute Guillain-Barré Syndrome (GBS), both TPE and IVIG are supported by high-quality evidence and are considered first-line therapies [10,14,38,39]. Early initiation of therapy is critical and appears more important than the specific modality chosen [1,21]. Recent meta-analyses confirm that both treatments result in comparable improvement in disability scores, duration of mechanical ventilation and mortality outcomes [38,39].

Therefore, treatment selection in GBS often depends on hemodynamic stability, renal function, thrombotic risk, venous access, institutional expertise, availability of IVIG. In hemodynamically unstable patients or those without reliable central access, IVIG may be preferable [4,14]. Conversely, in patients with significant renal dysfunction or previous severe IVIG-related complications, plasma exchange may be considered [16,34].

Chronic Inflammatory Demyelinating Polyradiculoneuropathy

In Chronic Inflammatory Demyelinating Polyradiculoneuropathy (CIDP), treatment strategy is guided by the chronic course of the disease. IVIG has demonstrated sustained efficacy in both induction and maintenance therapy in CIDP and is therefore frequently selected as first-line treatment [4,6,25]. Plasma exchange is typically reserved for patients with inadequate response to IVIG or corticosteroids, or for those requiring rapid clinical stabilization [4,14]. Long-term management considerations favor IVIG due to practicality, outpatient feasibility and availability of subcutaneous formulations [20,26].

Multifocal Motor Neuropathy

In multifocal motor neuropathy (MMN), therapeutic decision-making is more straightforward. IVIG represents the standard of care with consistent and sustained motor improvement [32,33]. Plasma exchange has not demonstrated durable benefit and is not recommended in routine MMN management [6].

Integrated Clinical Framework

Optimal treatment selection requires integration of disease phenotype, severity of neurological impairment, speed of progression, comorbid conditions (renal, cardiovascular, thrombotic risk), vascular access feasibility, healthcare system infrastructure and patient preference. Shared decision making is particularly important in chronic conditions requiring long-term therapy.

Gaps in Evidence and Future Directions

Despite decades of clinical use and multiple randomized controlled trials, several important uncertainties remain in the comparative evaluation of therapeutic plasma exchange (TPE) and intravenous immunoglobulin (IVIG) in inflammatory neuropathies.

Much of the foundational evidence in Guillain–Barré syndrome (GBS) derives from studies conducted in the 1980s and 1990s [9,10,14]. Although these trials established therapeutic equivalence, they were performed under historical standards of supportive care and did not incorporate modern outcome measures such as patient-reported disability scales and quality-of-life indices [2,40]. Sample sizes in early trials were modest, inclusion criteria heterogeneous, and long-term follow-up often limited [2]. Contemporary head-to-head randomized trials using standardized outcome metrics remain lacking.

In chronic inflammatory demyelinating polyradiculoneuropathy (CIDP), randomized data support short-term efficacy of both IVIG and TPE [6,14,27], yet direct long-term comparative studies are scarce. Given the chronic nature of CIDP, comparative effectiveness research over extended follow-up periods is particularly needed [29].

Sequencing and Combination Strategies

The optimal sequencing of TPE and IVIG remains incompletely defined. Although sequential therapy (e.g. plasma exchange followed by IVIG) is biologically plausible, clinical evidence has not demonstrated consistent additive benefit [14,15]. Moreover, theoretical concerns exist regarding removal of administered immunoglobulin if plasma exchange is performed shortly after IVIG infusion [15,16]. Prospective trials evaluating structured rescue protocols for treatment-related fluctuations are needed [22,23].

Biomarker-Guided Therapy

Advances in immunopathology have identified distinct antibody-mediated subtypes within inflammatory neuropathies. In GBS and MMN, antiganglioside antibodies such as anti-GM1 play a pathogenic role [7,33].

In CIDP, nodal and paranodal antibodies have been associated with specific clinical phenotypes and may influence treatment responsiveness [30,31]. However, the predictive value of these biomarkers for selecting between TPE and IVIG has not been systematically validated. Prospective stratified studies are required to enable personalized therapy.

Long-Term Outcomes and Health Economics

Long-term safety and comparative durability data remain limited, particularly in CIDP and MMN [29]. Existing cost analyses are context specific and highly dependent on local healthcare infrastructure [37]. Broader evaluations incorporating quality-adjusted life years and indirect societal costs remain scarce. Immunomodulatory mechanisms of IVIG continue to be explored, with emerging insights into Fc receptor modulation and immune network regulation [11,40]. As novel biologic therapies targeting complement and Fc receptors are introduced, the relative positioning of TPE and IVIG within therapeutic algorithms may evolve [11,12,36,40].

Conclusions

Therapeutic plasma exchange (TPE) and intravenous immunoglobulin (IVIG) remain the two principal immunomodulatory therapies in immune-mediated inflammatory neuropathies. In acute Guillain–Barré syndrome (GBS), substantial evidence from randomized controlled trials and meta-analyses supports broadly comparable efficacy between the two modalities in improving disability scores and accelerating recovery [10,14,38,39]. Consequently, in most patients with GBS, treatment selection should be guided not by efficacy differences, but by patient-specific clinical factors including hemodynamic stability, renal function, thrombotic risk, vascular access feasibility and institutional infrastructure [4,16].

In chronic inflammatory demyelinating polyradiculoneuropathy (CIDP), therapeutic strategy differs fundamentally from the acute setting. IVIG has demonstrated sustained benefit for both induction and maintenance therapy and is therefore frequently selected as first-line treatment [6,25]. Plasma exchange remains an effective short-term intervention but typically requires repeated procedures to maintain benefit, limiting long-term practicality [14,27].

In multifocal motor neuropathy (MMN), IVIG represents the established standard of care with consistent evidence of durable motor improvement [32,33], whereas plasma exchange has not shown sustained clinical benefit [6].

Both therapies are generally safe when administered appropriately, yet their adverse-event profiles differ. IVIG is associated primarily with infusion-related and thrombotic risks [35,36], whereas TPE carries procedural and vascular-access related risks [16,34].

Despite decades of clinical experience, important knowledge gaps remain regarding optimal sequencing strategies, biomarker-guided treatment selection, and long-term comparative cost-effectiveness [29,37]. Future prospective, stratified studies will be essential to refine personalized treatment algorithms and optimize patient outcomes.

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