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Long-term day-case treatment of peripheral neuromuscular disease with intravenous immunoglobulin: the practice of a regional day-case service in Preston, Lancashire

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ABSTRACT – Neuromuscular disease is one of the most common indications for the use of intravenous immunoglobulin (IVIG). We describe practical aspects of IVIG administration and dosing in long-term treatment, as well as the setting up of a day-case service in a regional neurology unit to provide a streamlined patient experience. An audit of the safety of IVIG administration and patient satisfaction during implementation supported the fact that this is a relatively safe treatment. Standardised assessment methods have been used both to monitor treatment effect and to provide the necessary outcome measures for Department of Health (DOH) monitoring of IVIG use.

KEY WORDS: Intravenous immunoglobulin, day-case treatment, neuromuscular disease

Introduction

Intravenous immunoglobulin (IVIG) is widely used for the treatment of a range of acute and chronic neurological conditions. In the UK, the treatment of neurological conditions, most commonly peripheral nerve disorders, accounts for over 40% of all IVIG use.[1] IVIG is expensive, but is a safe and relatively easy treatment option when compared to other treatment modalities.[2] Guidelines for use of IVIG have been drawn up by the Association of British Neurologists[3] and more recently by the UK Department of Health (DOH).[4,5] This paper describes the evolution of the service in Preston for patients having regular IVIG treatment over a 10-year period.

The IVIG programme

The Preston Neurosciences Centre provides neuroscience services to a population of about 1.4 million people in Lancashire. In 2002, the care of patients having IVIG was shared by all consultant teams with no specialist supporting team. All patients were treated on a short-stay inpatient ward as day cases, which posed significant logistical problems as bed availability could not be guaranteed. There were frequently significant delays in initiating treatment and interruptions to treatment once started, resulting in severe inconvenience to patients. Treatment decisions were often made by junior medical staff who were not well placed to make judgements on any changes that might be required. Without clear outcome measures to assess response to treatment, this could lead to treatment inertia, with the patient simply remaining on the same regimen for prolonged periods. Although there was little benchmark data, we were concerned that the complication rate of IVIG treatment (eg episodes of sepsis) was unacceptably high.

Over several years, starting from 2002, we implemented key changes in the care of patients on long-term IVIG. We appointed a neuromuscular specialist (NM) nurse, who amongst other roles supervises and monitors the IVIG treatment. A part-time peripheral nerve (PN) physiotherapist was also appointed. Over a period of time, the care of the majority of the patients was transferred to one consultant (John Nixon). The team developed a multidisciplinary approach to patient management. In addition to implementing a change to day-case care, the team provides an outpatient service in a specialist peripheral nerve clinic. This allows outpatient follow-up of some of our hospital-treated patients, monitoring of patients both on and off treatment, a route for patients to have urgent clinic review if needed, and ongoing physiotherapy input as needed.

In July 2006, a day-case IVIG treatment area (The Glasshouse) was opened with capacity for six patients to be treated simultaneously in chairs. The unit is supervised by the NM nurse, whose expertise and long-term knowledge of the patients is central to the success of the service. The PN physiotherapist provides physiotherapy treatment and assessment, and also assists with the monitoring of response to treatment. Once a week, there is a multidisciplinary ward round. The process is patient focussed, with enquiry about any complications of treatment and any symptomatic or functional changes. Specific outcome measures (eg the Berg balance test)[6] are used as needed. These tests are administered by the NM nurse or PN physiotherapist, providing continuity of patient care.

The prescribing of IVIG is subject to increasing scrutiny and regulation, and outcome measures provide evidence for efficacy as required by the DOH IVIG scheme (see www.ivig.nhs.uk for more information). We have not found the DOH guidelines on prescribing practice unduly restrictive and they stress areas of good practice, particularly in requiring the use of measurable

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outcomes. We pay particular attention to fluctuations related to the cycle of treatment – ie does the patient report significant decline in function at the end of the treatment cycle, suggesting that the cycle is too long, or a suboptimal response to treatment, suggesting the dose might be too low? As a result of this monitoring, each patient is given a tailored treatment programme in which the frequency of treatment (ie the treatment cycle) and the dose given at each treatment meets their specific needs.

We have 56 patients (34 male and 22 female) on regular IVIG treatment, most commonly for chronic inflammatory demyelinating polyneuropathy (CIDP) (Table 1). Their age range is 16 to 90 years (mean 57 years). Most of the patients have been on treatment for some time: 8 of them for over 10 years, and a further 8 for between 5 and 10 years. There are a small number of patients with other neurological conditions (Table 1).[7]

The NM nurse has facilitated the introduction of key improvements in patient care; for example, we now use specifically developed documentation to record infusion details. Infusions are administered according to clear protocols that include simple guidelines on the management of common infusion-related problems (eg a rise in blood pressure). We ensure that each patient is continuously treated with the same IVIG brand unless there are clinical reasons for a change. In any one treatment, we avoid using different batches of IVIG to help us manage batch-related infusion reactions.

We have initiated a home-therapy programme for patients on long-term IVIG. There is good evidence of the safety of long-term IVIG administration in the home environment and some UK centres have been offering home therapy for a number of years.[8,9] We have four patients on home therapy, with others currently being assessed for suitability. Interestingly, in a recent survey of our hospital patients, 29 out of 37 respondents stated a preference for continuing treatment in hospital.

Table 1. Patients on long-term IVIG by diagnosis.

Diagnosis	Number
Chronic inflammatory demyelinating polyneuropathy	30
Multifocal motor neuropathy	15
Ataxic sensory neuropathy	3
Mixed neuropathy (demyelinating, not CIDP)	2
Mononeuritis multiplex	2
CNS Sjogren's	2
Churg Strauss syndrome with vasculitic neuropathy	1
Myasthenia gravis	1

CIDP = chronic inflammatory demyelinating polyneuropathy; IVIG = intravenous immunoglobulin.

Results

The NM team has been active in developing a patient-centred service for people with peripheral neuropathy. The improvements we introduced include specific protocols and documentation, the routine use of objective clinical measures to monitor the patient's condition and to inform treatment decisions, an ongoing audit of complications of IVIG therapy, the establishment of a day-case treatment unit and the initiation of a home-therapy programme.

The opening of the Glasshouse day-treatment unit has transformed the quality of care with a significant rise in patient satisfaction. Waiting time before a treatment was started was measured at the time of the transfer of care from the ward to the Glasshouse. On the ward, the mean delay was 3 hours and 17 minutes, and in the unit, it was 34 minutes. Consequently, an opinion survey showed a much higher level of satisfaction with time of treatment in the Glasshouse.

Prior to the appointment of the PN physiotherapist, many of our patients were referred to community physiotherapy teams for assessment and treatment. There, they were often seen by therapists without specific neurological expertise. The work of the PN physiotherapist has been carefully documented to allow assessment of the impact of her work in the first 2 years and patient feedback obtained. The provision of a specialist physiotherapy service at the time of treatment was valued by the patients. An example of the value of her input was her work on assessing and treating the musculoskeletal effects of neuropathy on the foot. Despite the fact that patients had previously had physiotherapy assessment, around 50% required further treatment with devices such as insoles and ankle supports.

As the NM team prescribes most of the IVIG in long-term use, we have been in a good position to audit the complications of long-term IVIG therapy. We do not have accurate data on the overall incidence of adverse events. This is because most serious complications arise during or shortly after the first cycle of treatment and most of our audit data are taken from patients already established on treatment.[10] Over 7 years, we have gathered data on complications occurring in a total of 2,709 treatments cycles. A total of 63 complications were recorded (affecting 2.3% of treatment cycles), 47 of them minor (eg 1.7% had skin rash). The incidence of severe adverse events in patients established on treatment is low. The total number of severe events (ie life-threatening or non-life-threatening but requiring hospitalisation) in patients not having their first treatment was seven out of 2,702 treatments (0.3%). The incidence of serious complications has fallen since the NM team was established.

We have been able to establish how wide the range of treatment requirement is, both in dose of IVIG required and the frequency of treatment. The mean cycle length is just over 4 weeks (4.6 weeks). The scatter plot in Fig 1 shows the range of treatment cycles and doses for our 56 patients. It highlights the inadequacy of an approach in which patients are treated on a standard 4-week cycle using a dose calculated from their weight and not adjusted against their response to treatment.

Discussion

The existence of a dedicated NM team has facilitated significant improvements in the care of neurological patients having regular IVIG therapy. Specific protocols have evolved and there is now

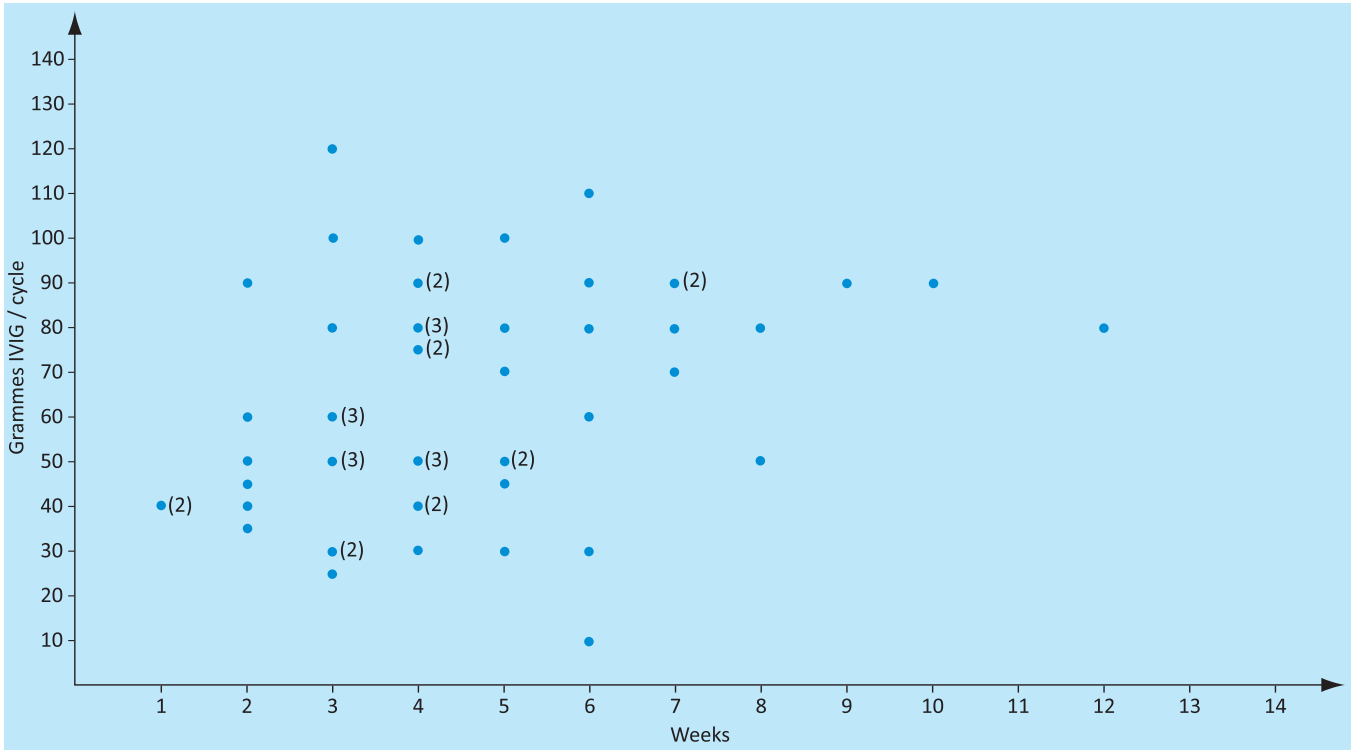

Fig 1. Treatment cycle and dose. Numbers in paraentheses refer to number of patients on a specific dose and cycle. IVIG = intravenous immunoglobulin.

considerable clinical experience in managing infusions. We now have good quality longitudinal data on complications of IVIG treatment, which we can use to benchmark future performance. The close monitoring of IVIG treatment by a specialist team has been associated with a decline in treatment complications.

Before the NM service developed, some patients were treated on a fixed cycle (usually about every 4 weeks) and given a specific dose for prolonged periods without any adjustment to suit their individual needs. We have established a system under which all patients are individually assessed using both objective outcome measures and the patient's own account of any symptoms and functional difficulties. This approach has several advantages. The assessments inform treatment decisions and allow us to meet the requirements of the DOH IVIG database. We periodically adjust the regimen to determine whether the patient still requires treatment. As a result, we have been able to take a small number of patients who have gone into remission (which otherwise would not have been detected) off treatment. Most importantly, the patient benefits from treatment that is tailored to their own needs, with a dose and treatment cycle determined by careful assessment of their response to treatment. The establishment of the NM team was the catalyst for a highly successful patient-led service development – a charitable appeal that raised enough money to build a day-treatment area. The transfer of care from an inpatient ward to a dedicated day-case treatment area has been a success. A survey of patient opinion shortly after the unit was opened demonstrated changes in a number of areas, reflecting significant improvements in the quality of the patient experience.

The concentration of expertise in a single team has allowed us to deal with less common aspects of treatment with confidence. One example is that we have recognised the small subgroup of patients who have sensory ataxic neuropathy and thus a requirement for high-dose treatment at frequent intervals (every 1–3 weeks). A standard treatment regimen would have left these patients under-treated, leading to significant avoidable disability. Another example is the management of patients who have had thromboembolic events while on treatment. Previously, their treatment would have been withdrawn indefinitely, again leading to significant disability. We have treated three patients for long periods by using simultaneous anticoagulation without ill effect.

Conclusions

1 IVIG is a well-established effective treatment for a range of neurological conditions with a good safety record in long-term treatment.
2 Good care is facilitated by a specialist multidisciplinary team; familiarity with each individual case is important.
3 Treatment needs to be individualised, taking into account that patients vary considerably in their requirement for IVIG. Treatment decisions are based on an ongoing assessment of the patient's response to treatment using objective measures.
4 The clinician must be prepared to adjust both dose and cycle to meet the treatment requirements of each patient, and must recognise that both will independently affect the patient's response.

5 Areas for development include home therapy, which is already well established in some centres, and the possible future substitution of subcutaneous immunoglobulin for IVIG in selected cases.[11,12] Further research to identify more convenient and less-intrusive treatment options is needed.

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Competing interests

Dr Nixon has undertaken paid consultancy work for some manufacturers of intravenous immunoglobulin preparations (BPL, Grifols and Baxter).

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