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Practice Patterns Relating to the Use of Intradialytic Parenteral Nutrition in Australian Renal Units: Results From a Survey of Renal Dietitians

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Abstract

Objective: The objective of this study is to document the patterns of usage regarding intradialytic parenteral nutrition (IDPN) within in-center hemodialysis units in Australia. Design and Methods: This study used purposive non-probabilistic sampling to obtain details of the proportion of units using IDPN; formulations used; infusion rates; and barriers and enablers to usage. All participants were practicing renal dietitians in Australia. The participants were recruited from professional nephrology networks and completed a cross-sectional self-administered online survey. Results: A total of 68 responses were received, representing 41% of dialysis units in Australia. Half did not use IDPN at all, and one-third (38.2%) used it regularly. The most common IDPN formulations used were triple phase bags (48.3%) and lipid-only infusions (22.6%). Variation in practice was seen regarding maximum infusion rates for some formulations. Costs for IDPN were borne by dialysis units (74%) or pharmacy (16%). Barriers to the use of IDPN included bureaucratic hurdles and misconceptions about IDPN as an effective form of nutrition support. The presence of a protocol, support from medical and other staff, and dietitian experience were enablers to the use IDPN. Conclusions: IDPN use in Australia is not uncommon. This survey extends the small evidence base about the practice of IDPN and identified some important variations in practice. Some barriers to IDPN use could be overcome with further training to support staff. Enablers to IDPN use include protocols with defined responsibilities and access to experienced clinicians.

Publication Details

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Conclusion: IDPN use in Australia is not uncommon. This survey extends the small evidence base about the practice of IDPN and identified some important variations in practice. Some barriers to IDPN use could be overcome with further training to support staff. Enablers to IDPN use include protocols with defined responsibilities and access to experienced clinicians.

Keywords: IDPN, parenteral nutrition, cross sectional survey, dietitian, nephrology

INTRODUCTION

Protein Energy Wasting in patients undertaking dialysis is common with a prevalence of 28-54% [1]. Intradialytic parenteral nutrition (IDPN) is a form of supplemental intravenous nutrition support available only to hemodialysis patients. It is considered in malnourished individuals who are having difficulty meeting adequate nutrition orally [2]. One obvious limitation associated with IDPN is that only a proportion of an individuals' nutritional requirements are able to be delivered during dialysis. Several reviews have also reported that there is limited evidence of significant clinical benefit [3-6] mainly because of limitations relating to study design [5,7]. Although IDPN use has been reported as widespread in North America [4], recent data regarding current IDPN usage is lacking. In the United States, prior to initiation of Medicare Part D coverage in 2008, the rate of IDPN use was 2.1-3.6 per 1,000 patients [8]. However, Medicare is no longer tracking IDPN usage, and Medicare Part D and other insurers have not consolidated this information.

Unlike the practice in the United States [4], and counter to recommendations in guidelines [9], the prescription of IDPN in Australia is not restricted. IDPN can be prescribed to any malnourished hemodialysis patient as a first line of nutrition support if deemed appropriate by the dietitian and/or the treating team. There are scarce details though on the nature of Australian IDPN practice patterns apart from one conference abstract from 2009 [10]. The results indicated there were significant variations in practice, with a wide range of formulas, rates of infusion and monitoring procedures. No further exploration of this has been undertaken in the past decade, despite an exponential increase in hemodialysis patient numbers [11], and greater clarification for clinicians regarding the definition of protein energy wasting [12]. No guidelines exist regarding ideal or safe infusion rates for IDPN, and anecdotal discussions between renal dietitians suggests that variations in infusion rates exist. Given

these evidence gaps, the aims of this study were therefore to describe the practice patterns of Australian renal dietitians regarding the use of IDPN. The specific objectives were to (i) estimate the proportion of hemodialysis units using IDPN (ii) describe the most common formulations of IDPN used (iii) describe the typical infusion rates used (iv) describe barriers and enablers to usage and (v) suggest recommendations for clinical practice.

METHODS

A ten-item questionnaire was developed by two experienced renal dietitians (XX and XX) based on the objectives of the study. The first three questions collected demographic information about the dialysis unit such as location and the size of the unit (number of patients). The remaining questions explored the solutions used; the department responsible for payment; details of the maximum IDPN infusion rate and monitoring; and barriers and enablers to use of IDPN. The questionnaire was uploaded to the web based online Surveymonkey platform [13]. Respondents were asked to describe or forward a copy of their IDPN protocol or policy to the corresponding author if they had one to allow further examination of practice variation.

Invitations to participate were sent to all seven state convenors of the Dietitians Association of Australia renal interest group. These were then distributed to all members of the interest group at the state level. For those who were known to be non-members of the association but practising as renal dietitians, the surveys were distributed directly via email. To ascertain response rate, the number and location of all dialysis units in Australia were obtained from the Australian New Zealand Dialysis and Transplant Registry [14].

RESULTS

A total of 68 responses were received, representing 112 (41%) haemodialysis units in Australia. The median number of patients in each unit that responded was 60 patients

(interquartile range: 40-113). One state returned no responses during the survey period, however this represented only three dialysis units (or 1%) nationally. Protocols were described by 15 respondents. An additional four indicated that they had a draft policy or protocol to guide practice. Protocols for the use of IDPN were also received from an additional eight respondents. All protocols described that initiation of IDPN was at the discretion of the dietitian after a comprehensive nutrition assessment. Only four units (12.1%) who used IDPN did not have a formal protocol / policy or procedure.

Of the units who responded to the survey, half (50%) reported that they did not use IDPN; 38.2 % used IDPN regularly; 10.3% used it rarely and 1.5% were unsure. The most frequently used formulation was a 3 in 1 / triple phase formulation of parenteral nutrition (48.3%); followed by lipid only infusions (22.6%); then lipids and amino acids simultaneously (16.1%) (Figure 1). Two units (2.5%) reported using amino acids only, and two units (2.5%) used both triple phase and lipid only infusions depending on patient needs.

A total of 34 responses were received regarding infusion rates. The maximum or goal infusion rate for triple phase formulations was reported as either 125ml (25%) or 250ml per hour, with most reporting 250 ml per hour (75%) (Figure 2). For amino acid only infusions, there was very little variation, and all reported using a maximum infusion rate of 125ml/ hour. The most common infusion rate was 125ml/ hour for lipid only infusions, with other maximum rates of 100ml, 150ml and 250ml/ hour reported. No response regarding infusion rate was reported by 21 units (61.7%). Of the 31 units who responded, the most frequent funder for IDPN was the dialysis unit (74%), followed by pharmacy (16%). Costs ranged from $16 AUD for a 500ml bottle of lipid; to $25 AUD for a 500ml bottle of amino acids; and a range of $65-84 AUD for a 1L bag of a triple phase formulation.

The most common barriers to IDPN use are shown in Figure 3. Respondents suggested that bureaucracy was a significant hurdle to use. This ranged from cumbersome paperwork to initiate IDPN to logistical hurdles. For example, one respondent reported that: “When IDPN is suggested by the dietitian, the renal unit registrar has to consider the request, then discuss with nephrologist. Then, a referral has to be made to the gastro unit to assess the patient for suitability”. Another respondent stated that “our protocol on IDPN use requires two trained registered nurses to be in attendance. But in some of our units we only have a dialysis technician and one registered nurse present”. Perceptions about the cost of IDPN and misconceptions by doctors that IDPN is an ineffective form of nutrition support were also barriers: “Nephrologists think that it is too costly with limited evidence” and “it is difficult to prove that much of it (IDPN solution) is absorbed”.

Enablers to the use of IDPN are shown in Figure 4. The presence of a protocol or policy facilitated use in many units. Support from medical, nursing staff, and multidisciplinary staff was considered important. One respondent stated: “Having a protocol with defined responsibilities in place is important as well as adequate training for staff”. Access to or the presence of dietitians with experience using IDPN were also reported to be important enablers to use. Training on IDPN use and confidence also featured as common enablers.

Free text comments were grouped thematically into two areas:(i) Use of lipid and amino acid formulations were driven by a desire to avoid administration of excessive glucose and fluid overload. Some sites reported that they wished to use other formulations but stated that hospital or health department parenteral nutrition tender policies or purchasing procedures made access to other formulations difficult (ii) Many respondents reported that they did not develop their own protocols, but rather had adapted protocols from other sites, usually those with more experience in IDPN use or from sites who used a similar formulation to theirs.

DISUSSION

This survey provides useful insights into the practical use of IDPN in Australia. In addition to the need for well conducted randomised trials, it appears that training on IDPN for dietitians and medical staff about the practicalities of patient selection, choice of formulation, rate of delivery, and commencement and monitoring procedures would be useful. Practical training for nursing staff may also be required. The results of this study expand on previous reports on IDPN use in Australia [10] and importantly describe barriers and enablers to the use of this form of nutrition support. One of the limitations of the survey is that the selection criteria and accurate details on the number of patients receiving IDPN was not described. Despite widespread distribution of the survey through professional networks, the relatively low response rate also provides indirect insights into the shortage of renal dietitians and dietetic staffing levels of dialysis units in Australia[15]. Units not represented are suspected to have infrequent or no dietetic staffing. Given that IPDN use is substantial in the Australian setting, we support previous calls in the literature [6] for longer term randomised clinical trials to be undertaken [16] and establishment of a clinical registry to expand the knowledge base and record hard outcomes associated with IDPN use.

PRACTICAL APPLICATION

This paper describes the use of IDPN in Australia. The results of this study suggest that training and the presence of experienced staff who know how to use IDPN facilitate its use. Strategies to overcome bureaucratic hurdles and enhance awareness of the potential benefits of IDPN may lead to more widespread use of this form of nutrition support in the Australian context.

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Figure 1. Types of formulations used for IDPN reported by renal dietitians in Australia.

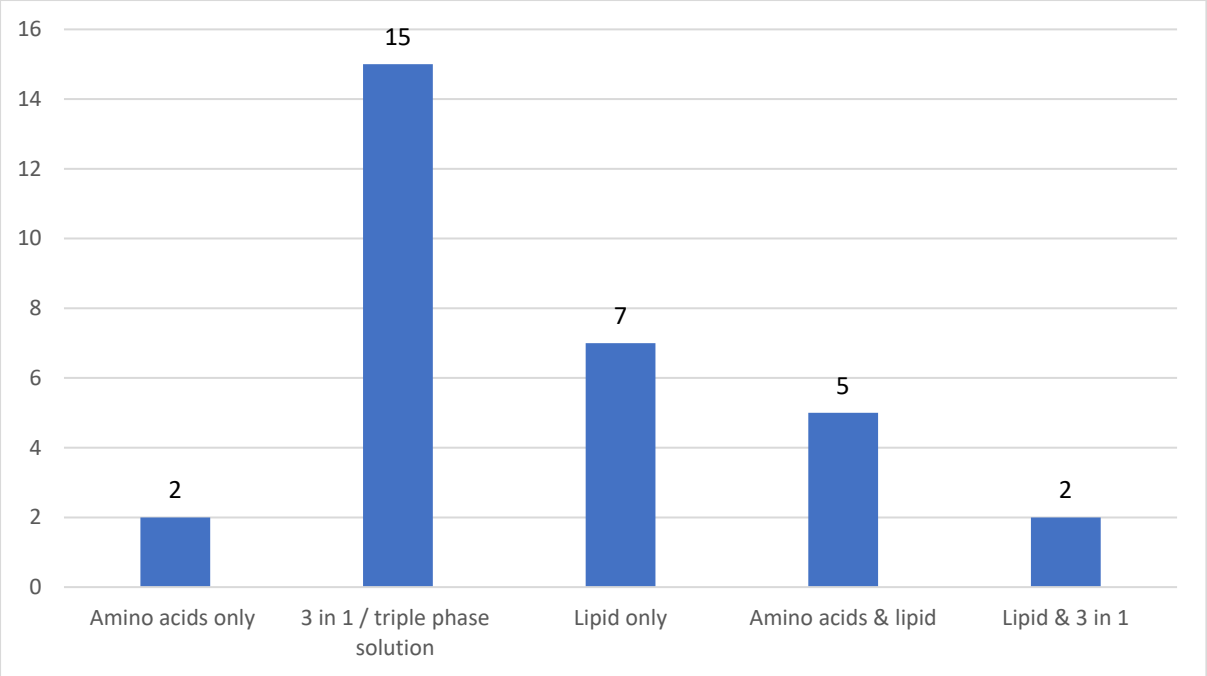


Figure 2. Maximum infusion rates for IDPN reported by renal dietitians in Australia.

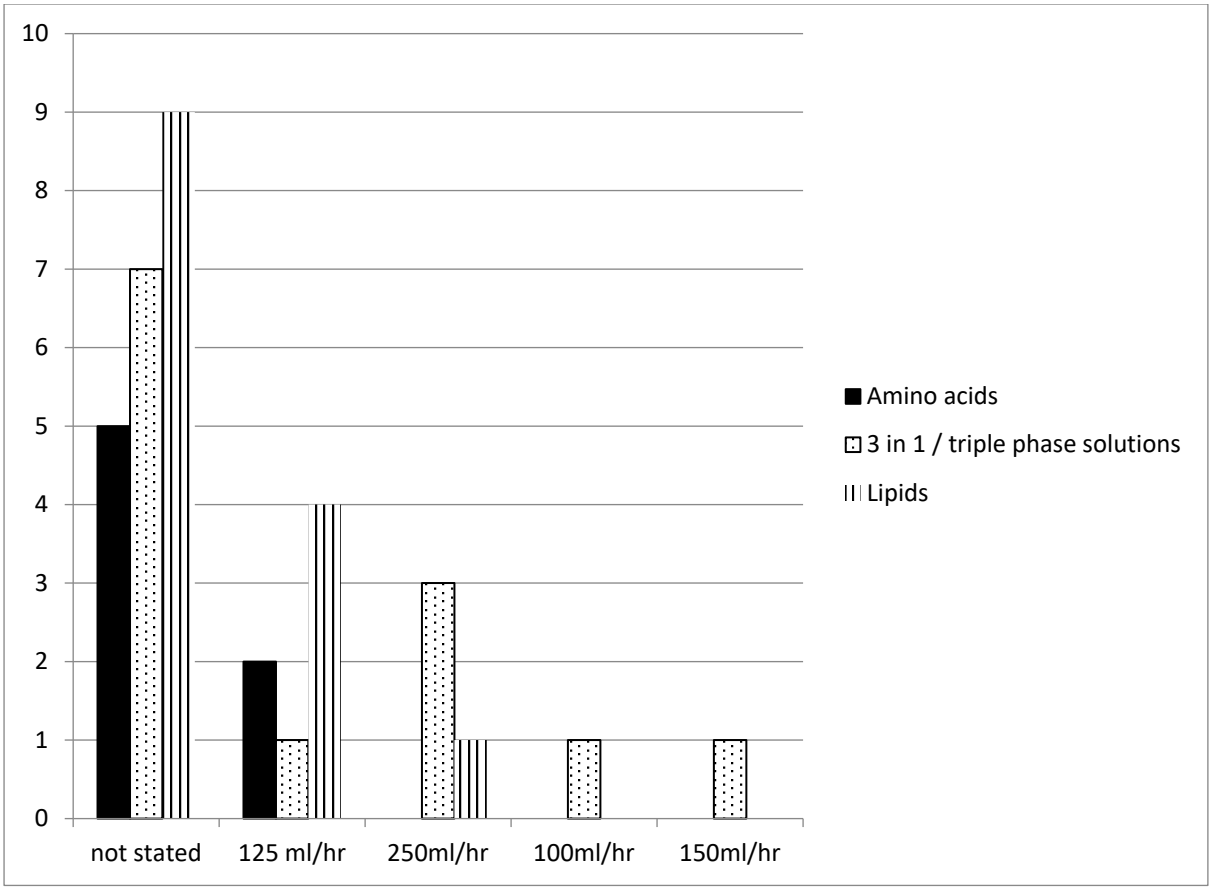
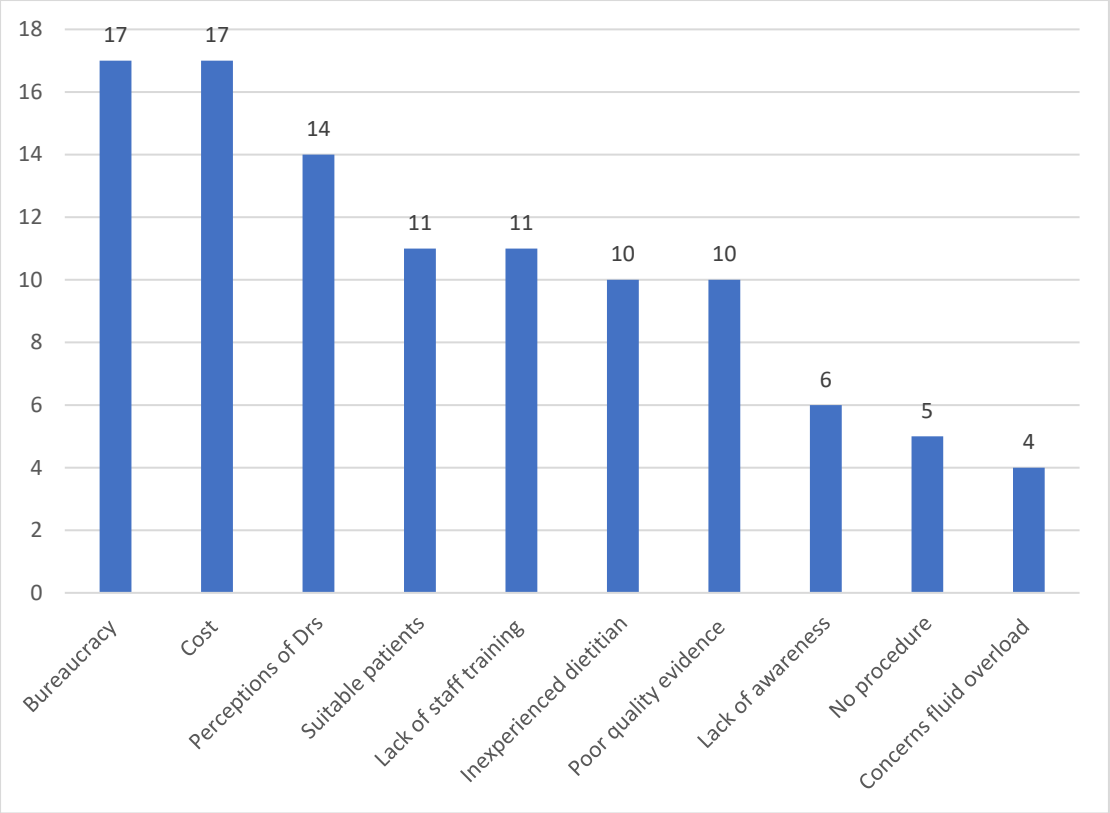
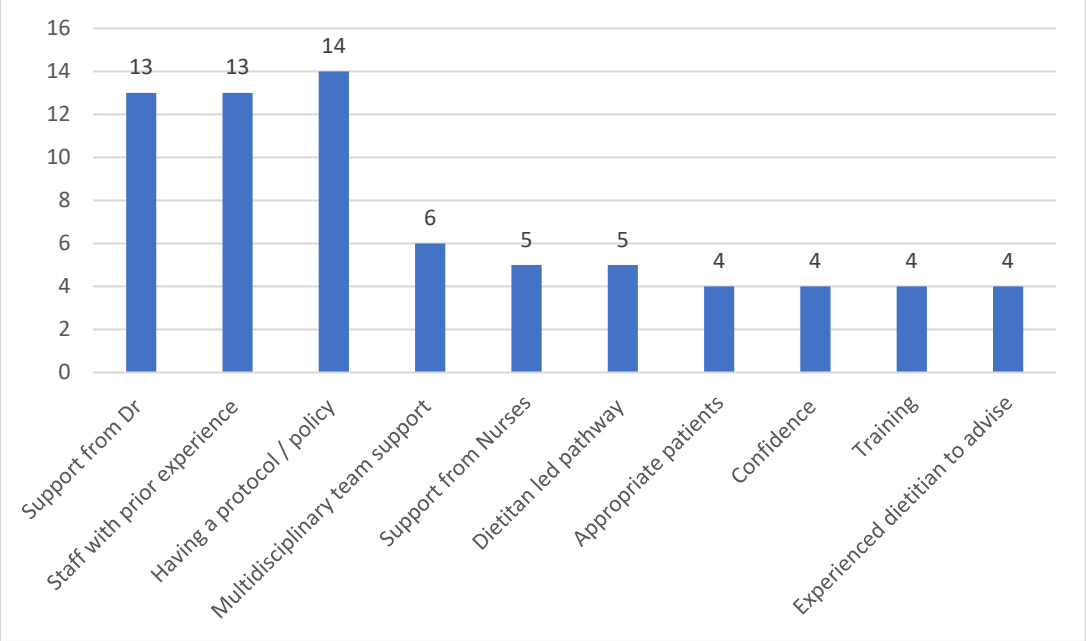


Figure 3. Barriers to the use of IDPN reported by renal dietitians in Australia.



Note: Respondents could state more than one barrier

Figure 4. Enablers to the use of IDPN reported by renal dietitians in Australia.



Note: Respondents could state more than one enabler