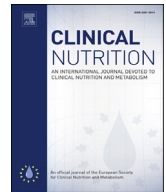




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Review

Q7 Water soluble vitamins and peritoneal dialysis – State of the art

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SUMMARY

This review presents the results of a systematic literature search concerning water soluble vitamins and peritoneal dialysis modality. We provide an overview of the data available on vitamin requirements, dietary intake, dialysis related losses, metabolism and the benefits of supplementation. We also summarise the current recommendations concerning the supplementation of vitamins in peritoneal dialysis and discuss the safety of an administration of vitamins in pharmacological doses.

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1. Introduction

It is generally accepted that peritoneal dialysis (PD) patients are at risk of malnutrition and that nutritional needs are specifically different in this group of individuals [1,2]. This is also the case for micronutrients, including both their deficiency and the danger of their accumulation. Contributors to increased risk of vitamin deficiency in CKD patients include: anorexia, dietary restrictions, impaired absorption, and dialysis-related losses [3]. Little is known about the antagonisms between uremic toxins and vitamin metabolism or about the safety and effectiveness of the vitamin supplementation. Nowadays, obvious avitaminoses, such as scurvy, beri-beri or pellagra, are rare. However, they may occur under some circumstances and the presence of CKD increases such a risk [4]. Manifestations of suboptimal micronutrient status, or marginal deficiencies, that may contribute to numerous symptoms and complications of CKD are presumably common. The vitamin needs of PD patients have not yet been comprehensively studied and much remains to be learned about the management of micronutrient disorders in this dialysis modality.

2. Objectives

We aimed to provide an overview and summary of the literature available regarding water soluble vitamins and PD modality. We

were interested in all published evidence to establish what exactly is known about vitamin status and about the differences in requirements, dietary intake, dialysis related losses, impaired metabolism and benefits of vitamin supplementation, that may be unique for PD.

3. Methods

With the assistance of an experienced librarian we conducted a search through the Medline-Ovid database (1946 to third week of February 2015) and the Cochrane Library (26 January 2015), using synonyms for the name of each vitamin (164668 records retrieved) combined with the term 'dialysis'. In the next step, we included only records written in English and concerning humans. Then, all the publications were limited to PD modality of RRT and studies in children were excluded. In cases of any unavailability of full-text publications, we included abstracts, provided the methodology and the results were informatively described. In the final step, we excluded studies in basic science or those containing repetitive data or that included combined dialysis modalities and where separate data were unavailable for PD. The whole procedure of searching through the literature is displayed in detail in Fig. 1. The relevance and eligibility of the retrieved records were considered by two authors independently. The number of included publications regarding individual vitamins are shown in Table 1. There were a few publications pertaining to more than a single vitamin and they have multiple references in the table. Additionally, we reviewed reference lists of reviews (one further relevant finding) and supplemented our work with recommendations from the European

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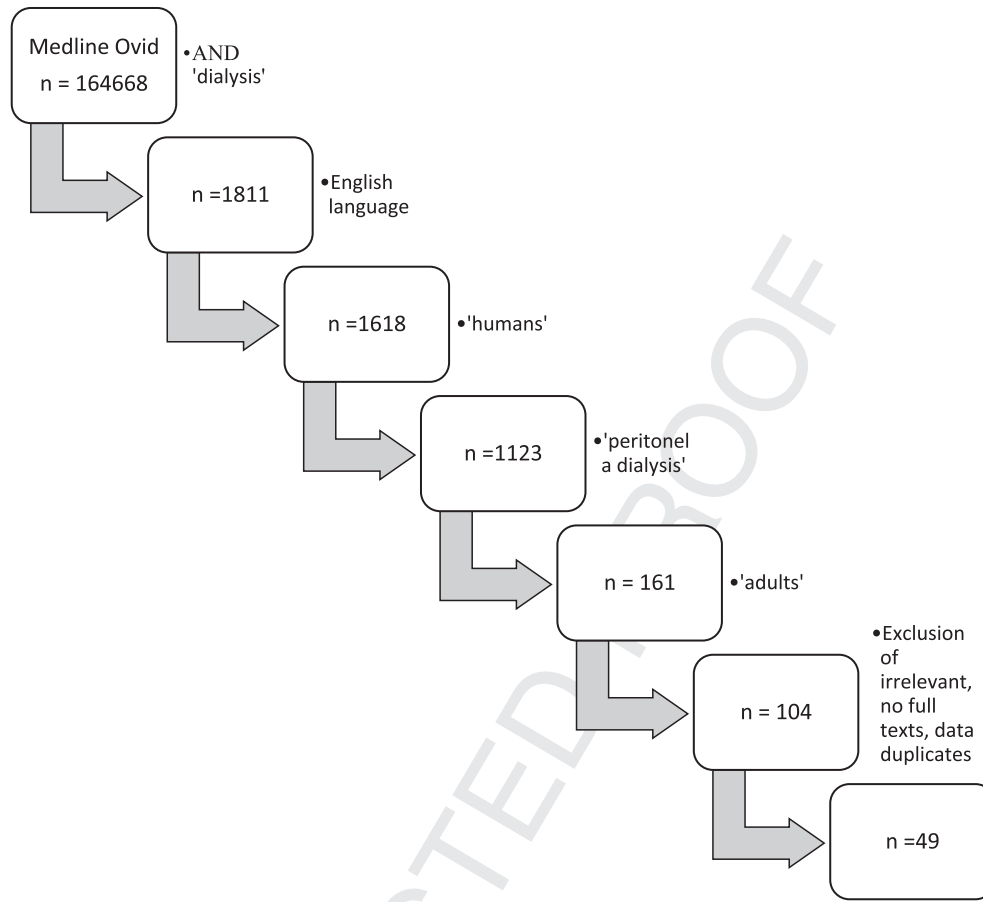


Fig. 1. Flowchart of the literature search strategy.

Best Practice Guidelines (EBPG) [2] and the European Society for Clinical Nutrition and Metabolism (ESPEN) [5].

4. Results

General information on the status of vitamins, dietary intake and peritoneal losses are summarised in Table 2. A summary of all

publications in which supplementation with a given vitamin was reported in PD patients, including the dose, the time and the result of intervention is shown in Table 4 (Appendix). Below we discuss the underlying reasons for the increased risk of water soluble vitamins deficiency in PD patients. Furthermore, we point to a knowledge gap and comment on current recommendations for each vitamin in view of the literature analysed.

Table 1
The number of publications on water soluble vitamins in peritoneal dialysis MEDLINE (state on Feb 26, 2015). 10 records were mentioned more than once in the table, as they regard more than one vitamin.

Vitamin (number, name, synonym)	No of retrieved records with a term: 'dialysis'	No of retrieved records with a term: 'peritoneal dialysis'	No of publications included	No of studies published in the last 5 years
B1 <i>thiamine, thiamin</i>	138	32	10	1
B2 <i>Riboflavin</i>	69	11	7	1
B3 <i>niacin, niacinamide</i>	91	12	6	1
B5 <i>pantothenic acid</i>	7	2	2	0
B6 <i>pyridoxine, pyridoxal, pyridoxamine</i>	433	53	17	1
B7 <i>Biotin</i>	88	9	2	0
B9 <i>folic acid, folate</i>	531	79	24	1
B12 <i>cyanocobalamin</i>	371	35	24	1
C <i>ascorbic acid, ascorbate</i>	614	52	18	4

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