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Review

Systematic review of economic evaluation studies and budget impact on ambulatory monitoring of capillary glucose in type 2 diabetics

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ABSTRACT

Objective: Realise a review of studies of economic evaluation about the ambulatory monitoring of capillary glucose (AMGC) in diabetic type II persons.
Methodology: A review of the literature was conducted, in MedLine, various websites, referenced paper and provided by expert's persons.
Results: Five studies concluded that the AMGC was a cost-effective strategic, of this papers use Kaiser Permanente data base, its make that these studies could be considered a solely one study. The rest of the papers did not find difference in the AMGC use.
Conclusions: The use of AMGC has an uncertainty efficiency. More studies are needed.

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1. Introduction

At present, diabetes one of the main public health problems around the world, among other reasons due to its high prevalence [1–3]. It must be pointed out that diabetes is associated with important micro-macrovascular complications and death [4–7].

From the perspective of the use of resources, the complications of diabetes involve a high socioeconomic cost and represent a substantial cause of medical care being required for the public health service, in particular affecting the most disadvantaged sectors of the population [8,9].

It has been described how diabetes sufferers may account for between 4% and 14% of the overall spending by western countries on health care, and that a patient with diabetes uses between 2 and 6 times more direct resources than individuals of similar ages and the same gender who suffer from other chronic diseases [10,11].

In this sense, strategies aimed at preventing complications and the adequate control of blood glucose levels currently constitute the key tools with respect to the medical management [12]. The WHO considers health education to be a vital aspect of the treatment of diabetes and the only effective solution for controlling the disease and preventing its complications [13,14]. Treatment cannot be effective if the patient does not understand why they must maintain a tight control over their blood glucose, is unaware of how to achieve this and does not know the appropriate strategies for resolving the problems which arise.

In this respect, a cohort study of 10,780 people diagnosed with type 2 diabetes revealed that patients who exercised inadequate or poor blood glucose control were associated with a higher direct cost than patients who exercised adequate control. Furthermore, patients who exercised adequate blood glucose control displayed a higher cost in terms of prescriptions for medication (HbA1c > 9%: $465, HbA1c 7–9%: $423 and HbA1c < 7%: $377 respectively), with these differences having been adjusted according to socio-demographic variables and others relating to how seriously ill the patients were, comorbidity and clinical complications [15].

Within the self-regulation of diabetes, testing capillary blood glucose levels using reagent strips is one of the most important methods; used alongside diabetes education these are fundamental decision-making tools. The use of self-monitoring of blood glucose (SMBG) is basically a self-analysis measure for subsequent self-regulation.

In terms of the use of SMBG, the literature published to date does not reach a clear consensus on its level of effectiveness in controlling type 2 diabetes mellitus in non-insulin treated patients [16–22]. This fact, along with the optimum frequency of carrying out SMBG [23], has led to a high level of controversy.

The fact that the use of SMBG among type 2 diabetes sufferers who do not use insulin represents a significant percentage of spending on health care and that its cost-effectiveness is not clearly demonstrated in the literature means that an important debate concerning this topic is currently going on in specialist circles [24]. These aspects, together with the increase in the prevalence of diabetes and the current economic crisis, lead any decisions to be made in terms of this subject to have, if possible, an even greater impact. The objective of this study was to carry out a systematic review of the research published on the economic evaluation and the budget impact associated with SMBG in people with type 2 diabetes.

Table 1 – Search strategies in the MedLine database.

Search	Terms used	Results
Strategy 1		
#1	"Costs and Cost Analysis"[Mesh]	155,385
#2	"Blood Glucose Self-Monitoring"[Majr]	1698
#3	"Diabetes Mellitus, Type 2"[Majr]	50,573
#4	Search (#1) AND (#2) AND (#3)	31
Strategy 2		
#1	"Blood Glucose Self Monitoring"[Majr]	1698
#2	"Diabetes Mellitus"[Mesh]	263,775
#3	"Reagent Strips"[Mesh]	2597
#4	Search (#1) AND (#2) AND (#3)	63

Key words or free terms used: Topic = (Blood glucose monitoring); OR Topic = (Self monitoring Blood glucose); OR Topic = (Reagent Strips).

2. Methodology

A systematic review of the literature was carried out. Table 1 shows the search strategies used in the MedLine database. Subsequently added to this search were the different documents obtained from consulting the Biblioteca Cochrane Plus, Bandolera, Health Technology Assessment, Canadian Agency for Drugs and Technologies in Health, Spanish Ministry of Health, International Network of Agencies for Health Technology Assessment (INAHTA) and the TRIP database. Finally, the review was enriched through a search for the articles referenced in the aforementioned works, as well as other documents of interest provided by different experts.

Identification of the articles was carried out by two reviewers who selected all of the studies which provided results on the efficiency and cost of blood glucose control arising from the SMBG and including original articles or reviews in English and Spanish, without any time limitation. Articles which were unrelated to diabetes, articles which were not original and qualitative studies were excluded.

Once the articles had been identified, the final selection of these was carried out in the following stages. In the first place the title and abstract of each article was read, and only those which might be related to the objective of this review were selected. Next, the full text was read in order to be able to exclude, with greater reliability due to increased information, any articles which did not fulfil the criteria specified. Once the documents found has been read and selected, a database containing the articles obtained from the search was created using Reference Manager Software. Any duplicate articles were subsequently excluded.

Following the definitive selection of the articles of interest, two researchers carried out an independent evaluation of the methodological quality of each article, with a third evaluator settling any discrepancies found. To achieve this, a checklist (Abellán) [25] was used, which has 12 dimensions. Each of these criteria is assigned a score based on its quality, in such