



Correlates of quality of life in adults with type 1 diabetes treated with continuous subcutaneous insulin injection[☆]

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Received 18 November 2008; received in revised form 20 February 2009; accepted 20 February 2009

KEYWORDS

Type 1 Diabetes;
CSII;
Quality of life;
RECPAM analysis

Abstract *Background and aims:* Aim of this study was to identify subgroups of adults with Type 1 Diabetes Mellitus (T1DM) treated with Continuous Subcutaneous Insulin Infusion (CSII) at higher risk of poor quality of life (QoL).

A sample of consecutive patients completed the Diabetes Specific Quality of Life Scale (DSQOLS), investigating the daily burden and restrictions related to diabetes. Lower DSQOLS scores indicate worse QoL perception.

Methods and results: The main results were obtained by using a regression-tree technique (REcursive Partitioning and AMalgamation – RECPAM) and multivariate logistic regression.

Overall, 472 patients aged between 18 and 55 years were recruited by 43 Italian centers. RECPAM analysis led to the identification of 5 classes characterized by a marked difference

[☆] Parts of this study have been presented at the 44th EASD Annual Meeting Roma, Italy – September 7–11 2008.

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in QoL. Male patients not reporting episodes of ketoacidosis and using CSII for >2 years had the lowest likelihood of scoring in the lower tertile of the DSQOLS summary score, and thus represented the reference category.

Patients who reported ≥ 1 ketoacidosis episodes (OR = 5.4; 95% CI 2.4–12.1) and female patients with a duration of diabetes of <10 years (OR = 5.9; 95% CI 2.6–13.5) had the highest likelihood of reporting poor QoL, while females with longer diabetes duration (OR = 2.4; 95% CI 1.3–4.7) and males treated with CSII for ≤ 2 years (OR = 2.2; 95% CI 1.1–4.6) showed a two-fold risk of poor QoL. Patient age, diabetic complications and civil status were globally predictive variables associated with poor QoL.

Conclusion: We identified subgroups of T1DM individuals treated with CSII showing a major impairment in QoL. Specific strategies are needed to help the patient cope with this therapeutic modality, especially during the initial phase of treatment.

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Introduction

Consistent data suggest that near-normal glycaemic control prevents or delays complications of diabetes.

Both continuous subcutaneous insulin infusion (CSII) and multiple daily insulin injection (MDI) regimens have been proven effective in achieving and maintaining near-euglycaemia [1–3]. Other studies have further suggested that when human regular insulin was used, CSII could reduce the rate of severe hypoglycaemia compared with MDI [4,5].

CSII can be prescribed to individuals with Type 1 Diabetes (T1DM) for different reasons, including poor metabolic control, erratic swings of blood glucose concentrations (unstable diabetes), pregnancy, desire for increased flexibility in lifestyle, and dawn phenomenon. According to published literature, there are numerous benefits to using CSII, including improvements in glycaemic control, larger reductions in glucose fluctuations and reduced rates of severe hypoglycaemia [6]. A positive impact of CSII on quality of life (QoL) has also been suggested, although existing evidence is conflicting, making a judgment about the quality of life benefits of insulin pump use difficult [7].

We have recently shown that patients treated with CSII, despite having more severe disease than those treated with glargine-based MDI, had reached almost identical levels of metabolic control, without negative impact on QoL. CSII patients also showed a lower perception of diabetes-specific burdens and restrictions [8] in line with the results of a previous randomized trial comparing CSII vs. NPH-based MDI [9].

To our knowledge, factors affecting QoL among individuals treated with CSII and the way clinical and socio-demographic characteristics interact have not been previously explored. A clear understanding of these interactions can be of particular importance for the identification of vulnerable subgroups with poor QoL, for whom specific interventions are needed.

Aims of this study were to evaluate clinical and socio-demographic characteristics associated with QoL perception among adults with T1DM treated with CSII, and identify subgroup of patients at higher risk of poor QoL.

Methods

The Equality1 study was a cross-sectional evaluation carried out between January and December 2006. Forty-

three Italian diabetes clinics recruited consecutive patients with type 1 diabetes, aged 18–55 years, and on treatment with CSII for at least 6 months. All patients used programmable pumps and short-acting insulin analogues. Patients were not included in the study if they were pregnant or had psychiatric problems limiting their ability to complete the questionnaires. All patients gave written informed consent. The local research ethics committee at each institution approved the study protocol.

Measurements

During a routine visit, participating physicians collected on ad hoc forms all data concerning demographics and diabetes history. Because normal ranges for HbA1c varied in the different centers, the percentage change with respect to the upper normal value (actual value/upper normal limit) was estimated and multiplied by 6.0. This allowed us to normalize HbA1c values with respect to a value of 6.0% [10].

Eye complications were defined as the presence of any grade of diabetic retinopathy or maculopathy on dilated eye examination, or cataract. Renal complications included micro- or macro-albuminuria, elevated serum creatinine levels ($>132 \mu\text{mol/l}$) and dialysis/transplantation. Diabetic neuropathy was defined as the presence of symptomatic somatic or autonomic neuropathy. Cardiovascular complications included coronary heart disease, myocardial infarction, stroke, and revascularization procedures.

Peripheral vascular complications were defined as the presence of intermittent claudication, ulcers, gangrene, and non-traumatic amputations.

At study entry, all patients completed the Diabetes Specific Quality of Life Scale (DSQOLS), a questionnaire designed to assess specifically the four main components of QoL (i.e. physical, emotional, and social burdens along with daily functioning) in patients with T1DM [11]. The questionnaire was anonymous, and its link with the information collected by participating physicians was ensured by a numerical code. We used the revised form of the DSQOLS [12] consisting of 57 items on diabetes related problems covering six areas: social relations (11 items), leisure time flexibility (6 items), physical complaints (9 items), worries about future (5 items), diet restrictions (9 items), daily hassles (6 items) and fears about hypoglycaemia (11 items).

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