Patient Education and Counseling 94 (2014) 417–422

Contents lists available at ScienceDirect

Patient Education and Counseling

journal homepage: www.elsevier.com/locate/pateducou

Attitudes to Treatment

Psychological insulin resistance in geriatric patients with diabetes mellitus

Anke Bahrmann [a,b,c,*], Amelie Abel [c], Andrej Zeyfang [d,e], Frank Petrak [f], Thomas Kubiak [g], Jana Hummel [b,c], Peter Oster [c], Philipp Bahrmann [b,h,**]

[a] Friedrich-Alexander-University Erlangen-Nürnberg, Department of Internal Medicine 2, Erlangen-Nürnberg, Germany
[b] Robert Bosch Foundation, Stuttgart, Germany
[c] Bethanien Hospital, Geriatric Centre of the University of Heidelberg, Germany
[d] University of Ulm, Department of Epidemiology, Germany
[e] Bethesda Hospital, Department of Internal Medicine and Geriatrics, Stuttgart, Germany
[f] LWL University Hospital, Ruhr-University Bochum, Department of Psychosomatic Medicine and Psychotherapy, Bochum, Germany
[g] University of Mainz, Institute of Psychology, Mainz, Germany
[h] Friedrich-Alexander-University Erlangen-Nürnberg, Institute of Biomedicine for Aging, Nürnberg, Germany

ARTICLE INFO

Article history:
Received 9 July 2013
Received in revised form 29 October 2013
Accepted 19 November 2013

Keywords:
Psychological insulin resistance
Insulin
Diabetes
Fear of injection
Depression

ABSTRACT

Objective: To determine the extent to which geriatric patients with diabetes mellitus experience psychological insulin resistance (PIR).
Methods: A total of 67 unselected geriatric patients with diabetes (mean age 82.8 ± 6.7 years, diabetes duration 12.2 [0.04–47.2] years, 70.1% female) were recruited in a geriatric care center of a university hospital.

A comprehensive geriatric assessment (CGA) was performed including WHO-5, Hospital Anxiety and Depression Scale (HADS), Mini Mental State Examination (MMSE) and Barthel-Index. We assessed PIR using the Barriers of Insulin Treatment Questionnaire (BIT) and the Insulin Treatment Appraisal Scale in a face-to-face interview.
Results: Insulin-naïve patients (INP) showed higher PIR scores than patients already on insulin therapy (BIT-sum score: 4.3 ± 1.4 vs. 3.2 ± 1.0; $p < 0.001$). INP reported in the BIT increased fear of injection and self-testing (2.4 ± 2.4 vs. 1.3 ± 0.8; $p = 0.016$), expect disadvantages from insulin treatment (2.7 ± 1.6 vs. 1.9 ± 1.4; $p = 0.04$), and fear of stigmatization by insulin injection (5.2 ± 2.3 vs. 3.6 ± 2.6; $p = 0.008$). Fear of hypoglycemia, however, did not differ significantly (6.3 ± 2.8 vs. 5.1 ± 3.1; $p = 0.11$). Depression was not shown to be a barrier to insulin therapy.
Conclusion: INP with diabetes have a significantly more negative attitude toward insulin therapy in comparison to patients already on insulin.
Practice implications: Systematic assessment of barriers of insulin therapy, individualized diabetes treatment plans and information of patients may help to overcome such negative attitudes, leading to quicker initiation of therapy, improved adherence to treatment and a better quality of life.

1. Introduction

Fears and reservations toward insulin therapy is known as psychological insulin resistance (PIR) and is common among both younger and middle-aged patients with diabetes. However to what extent multi-morbid elderly with diabetes are affected by fears toward insulin therapy has not yet been investigated. According to national and international guidelines, insulin therapy should be initiated in geriatric patients at the very latest with HbA1C levels over 64 mmol/mol (8%), who are undergoing oral antidiabetic drug therapy, to avoid hyperglycemic symptoms and the progression of diabetes late complications [1,2]. Unfortunately a significant number of type 2 diabetes sufferers do not receive insulin therapy in a timely manner as not only the patients themselves but also in many cases the treating doctors are reluctant to initiate insulin therapy [3,4].

* Corresponding author at: Friedrich-Alexander-University Erlangen-Nürnberg, Internal Medicine 2, Ulmenweg 11, 91054 Erlangen, Germany. Tel.: +49 9131 8535301; fax: +49 9131 8535357.
** Co-corresponding author at: Institute for Biomedicine of Aging, Friedrich-Alexander-University, Heimerichstraße 58, 90419 Nürnberg, Germany.
E-mail addresses: anke.bahrmann@uk-erlangen.de, anke.bahrmann@gmail.com (A. Bahrmann), philipp.bahrmann@iba.fau.de (P. Bahrmann).

0738-3991/$ – see front matter © 2013 Elsevier Ireland Ltd. All rights reserved.
http://dx.doi.org/10.1016/j.pec.2013.11.010

In a study by Hermanns et al. [3], negative attitudes toward initiation of insulin therapy may be promoted by the belief that the need for insulin therapy indicates a greater severity of the disease and is an indication of a failure to self-manage the diabetes adequately [3]. Maybe depression plays an important role for barriers of insulin therapy, as the study of Mollema et al. [5] reported higher levels of depression in patients with extreme fear of self-injection and hypoglycemia. Among patients with diabetes, depression is often associated with poor glycemic control and presence of micro- and macrovascular complications [6,7].

To the best of our knowledge, there are no studies yet that focus on attitudes toward insulin therapy in geriatric patients with diabetes mellitus aged over 70 years. This is of major importance, because negative attitudes toward treatment can discourage adherence to treatment plans [3]. Consequently, both hyperglycemic symptoms and diabetes late complications occur, which affect patient quality of life. An enhanced fear that insulin therapy is too difficult to manage in everyday life may play an important role in the barrier toward insulin therapy in the elderly. In addition the loss of autonomy and social stigma because of the need for insulin injections could be reasons for the development of PIR. To identify the source of these barriers in geriatric patients is a prerequisite to ensure optimal treatment adherence and self-management. We investigated whether geriatric patients experience substantial fear of injection and self-testing, and assessed their expectations regarding positive insulin-related outcomes, their expected hardship from insulin treatment, stigmatization by insulin injection, and fear of hypoglycemia.

We had three objectives: First, to assess PIR in geriatric patients with diabetes mellitus. Second, to gain insight into attitudes and beliefs of geriatric patients toward an indicated insulin therapy. Third, to determine the influence of depression on PIR in geriatric patients.

2. Methods

A comprehensive geriatric assessment (CGA) was performed on $N = 67$ geriatric patients (mean age 82.8 ± 6.7 years, HbA1C $6.9 \pm 1.3\%$, diabetes duration 12.2 [0.04–47.2] years, 70.1% female, Body-Mass-Index (BMI) 27.2 ± 5.1 kg/m^2, see Table 1) with diabetes mellitus, who were admitted to our geriatric hospital in a consecutive fashion over a period of three months. CGA is a part of routine care in acute geriatric hospitals in Germany. CGA is recommended by geriatric guidelines as it helps to identify functional deficits in older people and lowers overall mortality [8].

Reasons for acute hospital admittance were cerebral infarction (19.4%), exacerbation of diabetes mellitus (14.9%), acute infection (13.4%), myocardial infarction (7.5%), and other reasons (44.8%). Inclusion criteria were: age > 70 years and multimorbidity (three or more diagnoses) according to the guidelines of the Geriatrics Society [1], written informed consent, poor glycemic control (HbA1C $>$ 64 mmol/mol or $>8\%$) or blood glucose excursions, indication for insulin treatment because of acute diseases/contraindication for oral antidiabetics. Exclusion criteria were: dementia or other severe cognitive deficits precluding study participation, patients in palliative care.

The research protocol was approved by the local ethics committee and all patients gave written informed consent. HbA1C levels were determined. Glycemic control was measured by HbA1C through use of high pressure liquid chromatography (Limbach Laboratory, Germany: normal range: 4.2–6.0% (DCCT) or 22–42 mmol/mol (IFCC)).

Current medication, co-morbidities and acute complications such as symptomatic and or severe hypoglycemia (need of i.v. glucose or i.m. glucagon injection) or diabetic coma were assessed by patient self-reporting and medical records (see Table 1). Depression was diagnosed according to the DSM IV (Diagnostic and Statistical Manual of Mental Disorders) criteria.

The comprehensive geriatric assessment comprised the evaluation of long-term care (Barthel-Index [9]), cognition (Mini-Mental State Examination, MMSE), depression (Hospital Depression and Anxiety Scale, HADS) and quality of life (WHO-5). The geriatric assessment was done in a standardized one-to-one setting.

MMSE [10] scores of 24–30 points reflect no cognitive dysfunction, 18–23 points mild cognitive impairment, and below 18 points indicate severe cognitive impairment. The HADS [11] has a maximum score of 42 points, major depressive disorders are likely >11 points. The WHO-5 well-being scale was used to measure well-being [12]. The WHO-5 contains five items, which are all positively worded. A maximum score of 25 indicates optimal well-being, whereas a score of 0 indicates minimal well-being.

PIR was assessed using the "Barriers to Insulin Treatment Questionnaire" (BIT) [13] with a sum score (range 1–10 with higher values indicating higher PIR) and the following subscales: Fear of injection and self-testing, Expectations regarding positive insulin-related outcomes, Expected hardship from insulin treatment, stigmatization by insulin injection, and Fear of hypoglycaemia (range 1–10, with higher values indicating stronger agreement to the concept of the subscale). Patients were asked to answer the questionnaires within 30 min. Twenty-five patients (19.1%) were not able to perform the task appropriately and the interview technique was used to assess attitudes toward insulin therapy.

Furthermore appraisal of insulin therapy was measured by the Insulin Treatment Appraisal Scale (ITAS) [14]. The ITAS consists of 20 items to assess positive and negative attitudes toward insulin therapy. The respondent is asked to indicate on a 5-point Likert scale to what extent he or she agrees with each statement, from "strongly disagree" to "strongly agree". The ITAS calculates a sum score with a maximum score of 100 points reflecting severe negative appraisal of insulin therapy ($<$49 points slight concerns about insulin therapy, 49–62 points moderate, 62–75 points severe, $>$75 points most intensive concerns). The psychometric properties and reliability of the ITAS can be regarded as highly satisfactory (Cronbach's $a = .89$ (negative appraisal scale Cronbach's $a = .90$, positive appraisal scale Cronbach's $a = .68$).

2.1. Statistical analysis

All probability values were 2-sided and a probability level of $P < .05$ was considered significant. All calculations were done with IBM SPSS Statistics Version 20.0.0 (IBM Inc., Somers, NY).

Normal distributed values were registered as mean $\pm$ standard deviation, not normal distributed values as median and interquartile range. Comparisons were evaluated with chi-square-tests. Student's t-test and Wilcoxon-tests were used to compare the mean. Significance was set at $p < 0.05$.

3. Results

3.1. Comorbidity and medication

We recruited 67 multi-morbid geriatric patients with diabetes mellitus with a mean age of 82.8 ± 6.7 years. Even though the assessments had a mean duration of 1.5 h, we had no drop-outs during recruitment. 43 patients (64.2%) showed long-term diabetes complications (retinopathy 10.4%, polyneuropathy 35.8% and nephropathy 47.8%). Of the 67 patients, 64 (95.5%) had at least one geriatric syndrome such as urinary incontinence, cognitive decline, reduced mobility or a history of falls in the past year (see Table 1). Patients had a mean drug intake of 10.6 ± 2.8 drugs per day, while suffering from 11.9 ± 4.4 diagnoses. 18 patients (26.9%) were on a diabetes diet, 15 (22.4%) were on oral antidiabetic therapy (OAD), 25