Sexual activity in diabetic patients treated by continuous subcutaneous insulin infusion therapy

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Abstract

Background and aims. – As concerns over interference with sexual activity may be an obstacle to initiating pump therapy in diabetic patients, the aim of the study was to assess the impact of continuous subcutaneous insulin infusion (CSII) therapy on sexual activity.

Patients and methods. – Patients filled out a questionnaire on their demographic data, diabetes history, pump-treatment history, metabolic control, inconvenience/convenience of the pump and catheter, and information on sexual activity.

Results. – A total of 271 diabetic patients (aged 44 ± 17 years, 51% women, 22% single), treated with CSII for 4.2 ± 5.9 years and with a diabetes duration of 19 ± 11 years, filled out the questionnaire. Their HbA\textsubscript{1c} was 7.7 ± 1.1%, with 2.4 ± 2.1 mild hypoglycaemic episodes over the past week, and their frequency of sexual activity was: never 29.9%; < 1/month 12.3%; > 1/month and < 1/week 18.2%; and > 1/week 39.6%. Age and cohabitation were independently correlated with frequency of sexual activity (\(P < 0.0001\) and \(P < 0.0003\), respectively), but not diabetes duration or complications. To the question “Does the pump have an influence on your sexual activity?”, The answer was “no” in 90% and “yes” in 10%. However, intercourse frequency was significantly decreased in the latter (\(P = 0.04\)). On multivariate analyses, this negative influence of CSII was correlated with HbA\textsubscript{1c} (\(P < 0.05\)), discomfort with the pump (\(P < 0.05\)) and the number of mild hypoglycaemic episodes (\(P < 0.01\)).

Conclusion. – Frequency of sexual activity appears to be unaffected by pump therapy or diabetes, but is decreased by the expected characteristics—namely, age and being single. Also, only 10% of patients believe that CSII is an obstacle during sexual activity and, in particular, because of the catheter.

Keywords: Type 1 diabetes; CSII; HbA\textsubscript{1c}; Sexuality; Intercourse frequency

Résumé

Activité sexuelle chez les patients diabétiques traités par pompe à insuline.

Objectifs. – L’objectif de cette étude était d’évaluer l’impact du traitement par pompe à insuline sur l’activité sexuelle.

Patients et méthodes. – Les patients ont rempli un questionnaire concernant leurs données démographiques, le contrôle métabolique, la fréquence des relations sexuelles et l’influence de la pompe. La gêne de la pompe et du cathéter était évaluée par une échelle visuelle analogique.

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1. Introduction

The diabetes control and complications trial (DCCT) established that tight glucose control slowed the progression of the long-term complications of type 1 diabetes mellitus [1]. Also, continuous subcutaneous insulin infusion (CSII) therapy, using fast-acting insulin analogues, appears to be the most efficient means of achieving such glucose control [2–6]. However, only a minority of type 1 diabetes patients is treated with CSII, especially in France [7], and the reason for this reluctance is not economic, as full reimbursement has been in effect since November 2000. In fact, concerns over CSII interference with sexual activity may be an obstacle to initiating pump therapy in type 1 diabetics, as patients have to carry the pump at all times. Patients could be refusing CSII because of the fear that it might interfere with their sex lives and, especially, intercourse frequency. For this reason, the aim of the present study was to retrospectively evaluate the influence of CSII on sexual activity, as reported by diabetic patients who have accepted this form of treatment.

2. Patients and methods

All of the patients included in the present study were on a “pump” registry containing data on all diabetic patients treated with CSII by the 40 diabetologists practising in 15 hospitals or office practices in the Sud-Francilienne region of France (immediately south of Paris). For 6 months, physicians filled out questionnaires for every patient being treated by CSII. The questionnaire was designed both quantitatively (“How often do you have sexual intercourse? Never/<1 per month/> 1 per month”) and qualitatively (“Does the pump have a negative influence on your sexual activity? Yes/no”). The connection/disconnection of the catheter was also evaluated (“Do you disconnect the catheter during sexual intercourse? Never/rarely/sometimes/always”). The data-filled forms were then sent to the study centre and entered into a database.

2.1. Statistical analysis

For the statistical tests, SAS software version 9.1 (SAS Institute, Cary, NC, USA) was used. Descriptive statistics were computed as mean ± SD, and percentages were determined using the number of responses as the denominator. To test the relationship between the three sexual-activity factors and the other variables included in the questionnaire, analysis of variance (ANOVA) was used for quantitative variables and the chi-square test for qualitative variables. Logistic regression was used for the overall assessment of the link between sexual factors and the variables correlated with these factors. For all tests, P values less than 0.05 were considered significant.

3. Results

Altogether, 271 diabetic patients treated with CSII agreed to fill in the questionnaire, and their clinical characteristics are summarized in Table 1. Their demographic characteristics were: mean age 44 ± 17 years; 51% women; 22% single; and diabetes duration 19 ± 11 years. Their diabetic complications included retinopathy (45%), nephropathy (18%),

During the consultation visit, patients filled in a questionnaire concerning the inconvenience/convenience of the CSII pump and cather, using three visual analogue scales (VAS) to measure the burden represented by the catheter (“I am very bothered by my catheter”/“I am not bothered at all by my catheter”), their acceptance of the pump (“I don’t tolerate my pump at all”/“I tolerate my pump perfectly well”) and satisfaction with the metabolic results achieved by CSII (“I’m not satisfied at all with the result of my pump”/“I am perfectly satisfied with the result of my pump”).
neuropathy (32%) and macroangiopathy (10%). Pump indications were: poor metabolic control (HbA1c > 8%) 42%; glycaemic instability (recurrent hypoglycaemic episodes and/or severe hypoglycaemia) 34%; pregnancy 13%; injection intolerance 6%; lifestyle 2%; and insulin resistance 3%. The studied patients had been treated by CSII for 4.2 ± 5.9 years. HbA1c was 7.7 ± 1.1%, with 2.4 ± 2.1 mild hypoglycaemic episodes within the week prior to the visit, and 0.2 ± 0.6 severe hypoglycaemic episodes and 0.03 ± 0.2 ketoacidosis episodes during the past year; the average number of blood glucose determinations was 4.2 ± 2.0/day. The mean duration of use per infusion set was 3.1 ± 0.8 days, and the infusion set was disconnected by 241 (88.9%) patients for 37 ± 8 min/day. The reasons for disconnection were: washing 84%; sports 15%; and sexual intercourse 68%. Only 11.1% of patients reported never disconnecting their infusion set. The duration of disconnection did not correlate with either HbA1c, ketosis or ketoacidosis. Over the previous 6 months, infusion-set tolerance was considered good in 80.2% of patients, and most of the infusion-set-related adverse events were minor, comprising: irritation 9.0%; transient inflammation 6.0%; allergy to bandages 4.2%; and abscess requiring medical treatment 2.4%. No abscesses requiring surgical drainage occurred, and none of the local adverse events was influenced by either the type of infusion set or the frequency of infusion-set changes.

3.1. Visual analogue scale scores for discomfort, acceptability and satisfaction

Relatively few patients felt embarrassed by their pump: the VAS for “I don’t tolerate my pump at all” (= 0 cm) “I tolerate my pump perfectly well” (= 10 cm) was 8.5 ± 1.9 cm. The catheter was also relatively well tolerated, with a VAS for “I am very bothered with my catheter” (= 0)/ “I am not bothered at all by my catheter” (= 10) of 7.9 ± 2.2 cm. Patient satisfaction was high, with a VAS score for “I’m not satisfied at all with the result of my pump” (= 0)/ “I am perfectly satisfied with the result of my pump” (= 10) of 8.2 ± 2.0 cm.

3.2. Impact of continuous subcutaneous insulin infusion on sexual activity

3.2.1. Quantitative aspects

To the question “How often do you have sexual intercourse?” The answer was: never 29.9%; < 1/month 12.3%; > 1/month and < 1/week 18.2%; and > 1/week 39.6%. On univariate analyses,
intercourse frequency decreased with age ($P<0.0001$), living alone ($P<0.01$), higher HbA1c ($P<0.05$), and the presence of complications such as nephropathy ($P<0.05$), neuropathy ($P<0.05$) and macroangiopathy ($P<0.01$). Intercourse frequency did not correlate with the VAS for “dislike/like” of the pump or catheter. Multivariate analyses demonstrated that only age and cohabitation were independently correlated with sexual-activity frequency ($P<0.0001$ and $P<0.0003$, respectively), and not diabetes duration or complications (Table 2).

### 3.2.2. Qualitative aspects

To the question “Does the pump have an influence on your sexual activity?” The answer was: no 72%; yes 10%; no answer 18% (n = 49). Those patients who answered “yes” had a significant decrease in their self-declared frequency of sexual intercourse ($P<0.05$; Table 3). Yet, there were no clinical differences between these patients and the others in terms of complications, except for mild hypoglycaemic-event frequency, which was slightly greater ($3.2\pm 2.9$ vs $2.4\pm 2.1$, respectively; $P=0.058$; Table 3). All of the patients who did not answer this question had no sexual activity (Table 3). On multivariate analyses, the negative impact of the pump on the patient’s sex life, indicated by the answer “yes”, was independently associated with discomfort with the catheter ($P<0.05$), higher HbA1c ($P<0.05$) and more frequent mild hypoglycaemic events ($P<0.01$; Table 4).

### 3.2.3. Disconnection

To the question “Do you disconnect the catheter during sexual activity?”, The answer was: never 22%; rarely 12%; sometimes 18%; and always 48%. On multivariate analyses, catheter disconnection during sexual intercourse was independently associated with male gender ($P<0.05$), younger age ($P<0.05$), higher HbA1c ($P<0.05$) and catheter discomfort ($P<0.05$; Table 5). Disconnection was less frequent in patients with longer pump-therapy durations ($P<0.01$).

### Table 4

<table>
<thead>
<tr>
<th>Factor</th>
<th>Answer</th>
<th>$P$</th>
</tr>
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<tbody>
<tr>
<td>Bothered with catheter</td>
<td>“yes”</td>
<td>0.01</td>
</tr>
<tr>
<td>Mild hypoglycaemic episodes</td>
<td>“yes”</td>
<td>0.01</td>
</tr>
<tr>
<td>Diabetes duration</td>
<td>“yes”</td>
<td>0.02</td>
</tr>
<tr>
<td>HbA1c</td>
<td>“yes”</td>
<td>0.04</td>
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</tbody>
</table>

### Table 5

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<th>$P$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>Disconnection; in young vs older</td>
<td>0.01</td>
</tr>
<tr>
<td>Gender ratio</td>
<td>Disconnection; in men vs women</td>
<td>0.0029</td>
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<tr>
<td>Bothered by catheter</td>
<td>Disconnection</td>
<td>0.01</td>
</tr>
<tr>
<td>HbA1c</td>
<td>Disconnection; when HbA1c increases</td>
<td>0.03</td>
</tr>
<tr>
<td>Pump-therapy duration</td>
<td>Disconnection; when pump-therapy duration increases</td>
<td>0.05</td>
</tr>
</tbody>
</table>

### 4. Discussion

The aim of the present study was to evaluate the influence of CSII on self-declared sexual activity. To answer this question, we used a “pump” registry that had data for 271 adult diabetic patients treated with CSII in the Sud-Francilienne region of France. For 6 months during these patients’ visits, physicians filled in a questionnaire on their clinical data. The patients were also asked to answer questions on the impact of CSII on their sex lives. Most patients (90%) felt that CSII had no impact on their sexual activity. Data on CSII (duration of CSII, burden represented by the catheter and difficulty in accepting the device) did not correlate with intercourse frequency. On multivariate analyses, only the usual demographic data–single status and age–influenced intercourse frequency, as is observed in France in general [9]. Indeed, a survey of sexual activity in the general French population showed that, while 10% of those living with a partner reported having no sexual intercourse (vs 26% in our registry), the rate was 34% for people living alone (vs 45% in the present study population). Furthermore, in the general population as in our diabetic population treated with CSII, the frequency of sexual intercourse decreased with age [9]. A small percentage of our diabetic patients—10%—believed that CSII had a negative impact on their sexual activity. Interestingly, these patients had no clinical differences in comparison to the others except for metabolic control, which was impaired (higher HbA1c and a greater frequency of mild hypoglycaemic episodes; Table 3), and, as expected, a lower frequency of sexual intercourse. As to why these patients had greater CSII discomfort during their sexual activity, the answer was often because of the catheter. However, 18% of patients did not answer the question; the reason for this was that all of these patients reported no sexual activity at all (Table 3). The majority of patients who admitted to disconnecting the catheter during intercourse were particularly men, young people and those who felt embarrassed by the catheter. However, the longer their duration of CSII therapy, the more the patients kept their catheter connected during intercourse. This finding suggests that, over time, patients tolerate the device better and/or prefer to avoid the potential disadvantages of transient pump/catheter removal, despite the easy and temporary comfort of disconnection. Nevertheless, disconnection did not either worsen metabolic control or increase ketoacidosis frequency (data not shown).

The quality of life (QOL) in type 1 diabetes patients treated with CSII has been evaluated in the literature, but the results are mixed [10]. There is no strong evidence to support QOL benefits associated with CSII or otherwise, although the issue is clouded by poor methodology and inconsistent assessment of QOL in many trials. Most of the studies reported a problem of “inconvenience” with CSII, but gave no precise details [11–13]. A more recent case-control study demonstrated better QOL in CSII patients, compared with either a glargine- or NPH-based injected regimen, because of greater lifestyle flexibility, less fear of hypoglycaemia and greater treatment satisfaction [14]. However, we could find no data on patients’ sex lives, which could be an important factor for refusing CSII. The factors related to discontinuing CSII have been studied elsewhere [15,16]. For 27%
of patients, the reason given was “inconvenience” and “discomfort”. Being single was also a predictor of prematurely stopping CSII, suggesting that sexual activity could, indeed, be a cause.

Nevertheless, the results of the present study suggest that CSII does not interfere with sexual activity except in 10% of patients. This subgroup of patients feels particularly embarrassed by the catheter and, in some cases, it will lead to a decrease in their frequency of sexual intercourse. Yet, this disadvantage appears to diminish over time.

In conclusion, the present study demonstrates that CSII has no impact on sexual activity in the vast majority of patients, with only 10% of patients having their sexual activity disrupted by the pump and that mainly because of the catheter. Indeed, this indicates that new devices such as the “patch-pump”, which uses no catheter [17], needs to become available as soon as possible to improve the QOL of diabetic patients in general and that of the adversely affected minority of patients in particular. Indeed, all diabetic patients are likely to prefer such pumps. Nevertheless, even now, it is at least possible to prove to candidates for CSII that, for the vast majority of patients, the device is not an obstacle to sexual activity.

Conflict of interest

I have received fees from Medtronic and Roche.

References