Screening of lipohypertrophy in type 1 and type 2 OPD diabetes patients and factors influencing this condition

Abstract

Lipohypertrophy (LH) is a chronic complication of diabetes mellitus that is caused by frequent subcutaneous injections of insulin. This study examines the prevalence of insulin induced lipohypertrophy at injection sites in diabetes individual (Type 1 and Type 2), as well as the factors that have an influence on causing this condition. The research sampling consisted of 50 diabetes patients, who had been using insulin for at least 6months. Observation and palpation techniques were used in assessing lipohypertrophy in diabetics' subjects. Lipohypertrophy was assessed as present or not present. The presence of noticeable or palpable lump at the injection site indicated that lipohypertrophy was present. A questionnaire was developed using relevant literature and FIT guidelines. lipohypertrophy was identified in 12 of 50 study participant (24%). Data were analyzed using percentages, χ2 and logistic regression analysis. There was a strong relationship between the presence of lipohypertrophy with non –rotation of sites and needle re use. Other factors like duration of insulin therapy, needle length, and total injection per day also significantly associated with development of lipohypertrophy. It is important that these complications are recognized and managed appropriately. Absorption from these sites is unpredictable and can lead to erratic glycemic levels and unpredictable hypoglycemia. So diabetes education and counseling play important role in reducing occurrence of lipohypertrophy in insulin treated patients.

Keywords: Lipohypertrophy, hypoglycemia, patients, insulin injection, glycemic variability

Abbreviations: LH, Lipohypertrophy;

Introduction

i. 38% of type 2 diabetes patients need insulin within 10 years of diagnosis (UKPDS).
ii. Skin problem like lipoatrophy, lipohypertrophy (LH), edema and allergy. Among these Lipohypertrophy (LH) is a chronic complication of diabetes mellitus that which is caused by frequent subcutaneous insulin injection.
iii. Lipohypertrophy has in turn been associated with significantly increased level of glycemic variability, hypoglycemia and increase insulin dose.

Objective

The objective of this study was to,

i. Find out prevalence of lipohypertrophy in Type 1 and Type 2 diabetes patients.
ii. Factors associated with lipohypertrophy.

Method

The research sampling consisted of 50 OPD diabetes patients

i. Inclusion criteria

ii. Diabetes patients ( Type 1 and type 2 )
iii. Who had been using insulin for at least 6 months
iv. Exclusion Criteria:-

v. GDM.

vi. Patients who are not consenting.

vii. A questionnaire was developed using a relevant literature search and FIT guidelines. It comprised six MCQs that aimed to assess factors affecting LH, like the needle length, duration and frequency of insulin injection, needle re use and site rotation.

viii. Observation and Palpation techniques were used in assessing Lipohypertrophy. The presence of palpable or noticeable lump at injection site indicated presence of lipohypertrophy.

Results

i. Lipohypertrophy was identified in 13 out of 50(26%) of study participants.

ii. There were many factors which influence the development of Lipohypertrophy.

LH was more common in,

i. Patients who were injecting insulin with syringe compare to pen (p=0.042), and the patients who were taking insulin for longer duration (P=0.012).

ii. Patients who were using longer needle (p=0.005) and patients who were not rotating their insulin injection site (p=0.001). Patients who were using analogue insulin compare to human insulin. (p=0.048)
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There was no significant difference in age (p=0.23), gender (p=0.3), type of diabetes (p=0.273)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Category</th>
<th>Total</th>
<th>Lipohypertrophy present (n=33)</th>
<th>Lipohypertrophy absent (n=37)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>Male</td>
<td>23 (46%)</td>
<td>9 (39%)</td>
<td>14 (38%)</td>
<td>0.611 (N=1) t test</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>27 (54%)</td>
<td>9 (38%)</td>
<td>18 (51%)</td>
<td>0.3 (N=1) Chi square</td>
</tr>
<tr>
<td>Diabetes duration</td>
<td>Type 1</td>
<td>10.9 ± 5.8</td>
<td>13.6 ± 11.2</td>
<td>9.5 ± 1.9</td>
<td>0.311 (N=1) t test</td>
</tr>
<tr>
<td></td>
<td>Type 2</td>
<td>10.9 ± 5.8</td>
<td>13.6 ± 11.2</td>
<td>9.5 ± 1.9</td>
<td>0.277 (N=1) Chi Square</td>
</tr>
<tr>
<td>Insulin type</td>
<td>Human insulin</td>
<td>22 (46%)</td>
<td>8 (36%)</td>
<td>14 (42%)</td>
<td>0.064 (N=1) Chi Square</td>
</tr>
<tr>
<td></td>
<td>Analogue</td>
<td>26 (52%)</td>
<td>16 (70%)</td>
<td>10 (26%)</td>
<td>0.002 (N=1) Chi Square</td>
</tr>
</tbody>
</table>

iii. There was no significant difference in age (p=0.23), gender (p=0.3), type of diabetes (p=0.273)

There was no significant difference in age (p=0.23), gender (p=0.3), type of diabetes (p=0.273)

Conclusion

i. From this study it is concluded that, the prevalence of LH is high, and factors associated with lipohypertrophy were, patients who take multiple insulin doses, longer duration of insulin use, needle re use more than 5 times and longer needle length.

ii. Our study also showed that not rotating injection site is one of the main reason for LH

Key message

i. Diabetes educator must examine every person with LH, who are on insulin therapy. More education and counseling is needed for who have been taking insulin for long period of time and multiple injection doses.

ii. By auditing the factors that have an influence on LH, the diabetes educator can focus on key areas in education that will help to prevent this condition from occurring.

Acknowledgements

None.

Conflict of interest

The author declares no conflict of interest.

References


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