

## **Lipohypertrophy prevalence and its associated risk factors in insulin-treated patients with type 2 diabetes in North Borneo, Malaysia**

### **ABSTRACT**

**Background:** Insulin-treated diabetes patients are at high risk of developing lipohypertrophy, which can negatively impact treatment outcomes. Early detection of lipohypertrophy is crucial to preventing blood glucose fluctuation. Unfortunately, this clinical issue is often overlooked by nurses, causing the development of vascular complications, which leads to an increase in the morbidity and mortality of the type 2 diabetes mellitus population. **Objective:** This study was conducted to identify lipohypertrophy prevalence and to establish the association between the presence of lipohypertrophy and its associated risk factors, including years on injection, total injection in a day, total insulin unit per day, often change needle, insulin injection site and move to a different area. **Methods:** This cross-sectional study included 128 patients with type 2 diabetes mellitus who received insulin therapy in an outpatient diabetic clinic. Questionnaires on socio-demographic and lipohypertrophy-associated risk factors were distributed among patients, and lipohypertrophy-assessment was done using a checklist. Descriptive statistics and Pearson Chi-square were used for statistical analysis. **Results:** The prevalence of lipohypertrophy was 51.6% (95% CI: 42.6, 60.5). Swelling on fatty tissue (46.1%) exhibited the highest percentage of lipohypertrophy features during the assessment. Pearson Chi-Square revealed a significant relationship between the presence of LH and BMI categories ( $\chi^2 = 10.059$ ,  $df = 3$ ,  $p = 0.018$ ), duration of injection ( $\chi^2 = 15.001$ ,  $df = 3$ ,  $p = 0.002$ ), frequency of needle replacement ( $\chi^2 = 9.525$ ,  $df = 3$ ,  $p = 0.023$ ) and rotation of injection site ( $\chi^2 = 5.914$ ,  $df = 1$ ,  $p = 0.015$ ). **Conclusion:** The high prevalence of lipohypertrophy indicates a need for a prevention strategy. Thus, nurses should play an important role in educating patients regarding the proper administration of insulin injections and performing a routine lipohypertrophy assessment and health education on the correct method of insulin injection.