**Estimation Risk Model as a New Method of Insulin Induced Lipohypertrophy Diagnostics in Diabetic Patients**

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**Objectives:**

To develop the estimation risk model of insulin induced lipohypertrophy (LH) in diabetic patients

**Material and methods:**

- 140 diabetic patients, who had been under the treatment with insulin a mean 8 years
- 2 groups: I - 117 patients with LH
  - II - 23 diabetics without pathologic areas of subcutaneous fat

**Statistics:**

- Rank correlation coefficients
- Binary logistic regression
- ROC-analysis and measure AUC, p<0.05

**Results:**

**I stage**

- Painfulness of injections: 0.686
- Quantity of injection by one needle: 0.666
- Duration DM: 0.656
- Duration of insulinotherapy: 0.656
- Presence of drop on the tip of the needle: 0.632
- Rotation of injection sites: 0.623
- Needle retention in skin after injection: 0.644
- Body mass index: 0.640
- Diabetic mellitus education: 0.542
- Usage of human insulin: 0.571

**II stage**

- Painfulness of injections: 1.62
- Quantity of injection by one needle: 0.76
- Duration DM: 0.31
- Duration of insulinotherapy: 0.27
- Presence of drop on the tip of the needle: 0.13
- Rotation of injection sites: -0.04
- Needle retention in skin after injection: -0.21
- Body mass index: -0.22
- Diabetic mellitus education: -1.46
- Usage of human insulin: -1.38

\[ p = \frac{e^z}{1 + e^z} \]

\[ z = 17 - 0.22xT_1 + 0.27xT_2 + 0.31x\text{IMT} - 11.38xK_1 - 0.21xK_2 - 0.04xK_3 + 0.76xK_4 - 1.46xK_5 + 1.62xK_6 + 0.13xK_7 \]

**Clinical case**

Woman L., 59 years, is diabetic patient during 8 years, who is under the treatment with insulin last 2 years. She was successfully studied Diabetic mellitus education 2 years ago. Patient uses human insulin, rotation of injection sites is haphazardly, needles change once in day, needle retention in skin after injection is less than 5 second. Sometime insulin injection is painful. There is a presence of drop on the tip of the needle after injection. Physical examination: there is no palpable and visible site of LH, body mass index is 28 kg/m²

**Conclusions:**

Nowadays, LH remains severe insulinotherapy complication. Primary prevention is necessary for diabetic patients with pathologic areas of subcutaneous fat.

Therefore, we developed the estimation risk model with good quality and high predictive value (86%) for diabetic patients who are under the treatment with insulin.