Factors Associated With Glycemic Control in Insulin-Treated Patients With Type 2 Diabetes

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Purpose: To explore the associated factors of glycemic control in patients with Type 2 diabetes and received insulin treatment.

Methods: Overall, 255 patients with Type 2 diabetes who had been diagnosis with Type 2 diabetes more than 3 months and received insulin treatment more than 3 months were recruited from 2 hospitals by convenience sampling in Taiwan. A self-reported questionnaire was used to collect demographic data (gender and age), disease characteristics (duration of diabetes, duration of insulin injection, combining oral therapy, and body mass index), treatment factors (adherence rate of frequency and dose of insulin injection, adherence rate of blood sugar monitoring) and psychosocial factors. The collected psychosocial factors included decisional balance of insulin injection (relative weigh between positive and negative attitude toward insulin injection), health literacy, empowerment perception, self-efficacy of insulin injection, and diabetes distress. The last HbA1c levels before receiving insulin injection and the latest HbA1c levels after administering questionnaire were collected from medical records of each participant.

Results: The mean of HbA1c levels was 8.35 ± 1.48. Only 16.5% (n=42) of participants had their HbA1c levels smaller than 7%. The bivariate correlations analysis indicated that the last HbA1c levels before receiving insulin injection positively and significantly associated with HbA1c levels (r=0.272, p<0.001). Body mass index (r= 0.119, p=0.029), adherence rate of frequency and dose of insulin injection as well as adherence rate of blood sugar monitoring did not significantly associate with the HbA1c levels. Decisional balance of insulin injection (r= -0.172, p=0.003), health literacy (r= -0.130, p=0.019), empowerment perception (r= -0.198, p=0.001), and diabetes distress (r=0.144, p=0.011) significantly correlated with the latest HbA1c levels. Multiple regression analysis indicated that the latest HbA1c levels before initial insulin injection (β=0.285, p<0.001), body mass index (β=0.129, p=0.030), adherence rate of frequency of insulin injection (β= -0.133, p=0.029), empowerment perceptions (β= -0.157, p=0.020), and diabetes distress (β=0.156, p=0.022) were important explanatory factors of HbA1c levels.

Conclusion: Adherence of frequency of insulin injection was more important than adherence of dose of insulin injection and blood sugar monitoring to associate with current latest HbA1c levels. Beside treatment factors, healthcare providers need to consider the psychosocial factors of patients with Type 2 diabetes and receive insulin treatment. Empowerment care and reducing diabetes distress might benefit glycemic control in insulin-treated patients with Type 2 diabetes.

Title:
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Abstract Summary:

Adherence rate of frequency of insulin injection, empowerment perceptions, and diabetes distress were important explanatory factors of HbA1c levels in insulin-treated patients. Nurses providing care to patients with type 2 diabetes and received insulin injection may be interested in this article.

Content Outline:

I. Introduction
   A. Early initial insulin treatment is frequently recommended for patients with type 2 diabetes but with poor glycemic control.
   B. Many studies have found that even patients with Type 2 diabetes transferred to receive insulin treatment did not achieve optimal glycemic control.

II. Body
   A. Main Point #1 Decisional balance of insulin injection, health literacy, empowerment perception, and diabetes distress significantly correlated with the latest HbA1c levels
      1. Supporting point #1 Decisional balance of insulin injection ($r= -0.172, p=0.003$), health literacy ($r= -0.130, p=0.019$), empowerment perception ($r= -0.198, p=0.001$), and diabetes distress ($r=0.144, p=0.011$) significantly correlated with the current latest HbA1c levels.

   B. Main Point #2

The last HbA1c levels before initial insulin injection ($\beta=0.829, p<0.001$), body mass index ($\beta=0.134, p=0.030$), adherence rate of frequency of insulin injection ($\beta= -0.134, p=0.029$), empowerment
perceptions ($\beta=-0.173$, $p=0.011$), and diabetes distress ($\beta=0.164$, $p=0.016$) were important explanatory factors of current latest HbA1c levels.

The last HbA1c levels before initial insulin injection, body mass index, adherence rate of frequency of insulin injection, empowerment perceptions, and diabetes distress were important explanatory factors of HbA1c levels.

1. Supporting point #1 a) The last HbA1c levels before initial insulin injection ($\beta=0.829$, $p<0.001$), body mass index ($\beta=0.134$, $p=0.030$), adherence rate of frequency of insulin injection ($\beta=-0.134$, $p=0.029$), empowerment perceptions ($\beta=-0.173$, $p=0.011$), and diabetes distress ($\beta=0.164$, $p=0.016$) significantly explained the HbA1c levels.

III. Conclusion
A. Adherence of frequency of insulin injection was more important than adherence of dose of insulin injection and blood sugar monitoring to associate with current latest HbA1c levels.
B. Empowerment care and reducing diabetes distress might benefit glycemic control in insulin-treated patients with T2 DM diabetes.

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