

Are insulin pumps underutilized in type 1 diabetes? Yes

Background information

- The use of continuous subcutaneous insulin infusion (CSII), or 'pump therapy', varies throughout the developed world, from 1% to 20% of patients with type 1 diabetes.
- Low rates of usage may reflect financial constraints, lack of trained healthcare professionals, poor recognition of the effectiveness of CSII, or uncertainty about the type of patients suitable for this treatment approach.¹⁻³

Aims

- To demonstrate that many patients with type 1 diabetes who do not achieve effective glycemic control using multiple daily insulin injections (MDI) are suitable candidates for CSII.

CSII improves hypoglycemia rates

- CSII is associated with reductions in the frequency of severe hypoglycemia of approximately 70% compared with MDI.⁴⁻⁶
- Based on the current evidence, severe hypoglycemia does not appear to be reduced with insulin glargine-based regimens when compared with isophane insulin-based regimens.⁷
- Approximately 5% of patients with type 1 diabetes account for most episodes of severe hypoglycemia (70%).⁸ These patients could benefit from CSII.

Overall glycemic control benefits

- In patients who do not achieve good glycemic control using MDI, switching to CSII is associated with improvements in HbA_{1c} levels that are directly proportional to the HbA_{1c} value at the time of switching (i.e. the biggest improvements occur in patients with the poorest glycemic control).
- Despite the introduction of long-acting insulin analogs, approximately 15% of MDI-treated patients still have elevated HbA_{1c} levels and could be considered for CSII.
- Variability in blood glucose (BG) levels, over 24 hours and from day to day, can be improved by switching patients with persistent hyperglycemia from MDI to CSII.^{9,10}
- Patients with elevated HbA_{1c} levels and wide fluctuations in BG levels are eligible for CSII.

Dawn phenomenon and quality of life

- The dawn phenomenon (high BG levels before breakfast) can be successfully managed using CSII, by presetting the basal insulin infusion rate to increase during the early hours of the day.¹¹
- Patients report quality of life benefits using CSII compared with MDI.⁶ CSII uptake would almost certainly increase if patients were allowed to choose their own mode of treatment.

Key points

- Approximately 15–20% of patients with type 1 diabetes could be offered a trial of continuous subcutaneous insulin infusion (CSII).
- Using CSII in place of multiple daily insulin injections (MDI) may reduce the frequency of severe hypoglycemia by ~70% in some patients with type 1 diabetes.
- Patients whose blood glucose levels are poorly controlled on MDI will benefit most from CSII.

For more information, speak to your Medtronic Diabetes representative.

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Conclusions

- CSII should be considered for patients with type 1 diabetes in whom hypoglycemia occurs frequently, and those with persistently elevated HbA_{1c} levels and/or wide fluctuations in BG levels despite an adequate trial of MDI.
- These patients represent 15–20% of those with type 1 diabetes.

Author

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Reference

Diabetes Care
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Type of study

Review

From the author

“...in a survey in the US in 2000, more than half of the diabetes specialists who themselves have type 1 diabetes were being treated by pump therapy”¹²

Additional references

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