



Achieving Desirable Glycemic Targets without the risks of Hypoglycemia using a teletitration Program

DTMS

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Abstract

Tight glycemic control is mostly unachievable in clinical practice due to fear of serious symptomatic hypoglycemia. UKPDS has shown that each 1% reduction in mean A1c was associated with 37% reduction in microvascular complications and 21% reduction in the risk of deaths related to diabetes, with the lowest risks associated with A1c value of below 6%. In our centre we use a software based Diabetes Tele Management System (DTMS) for those subjects willing for a regular follow up either through the telephone or internet. Trained staffs, dedicated telephone lines and networked computers enabled data collection. Subjects were highly motivated and taught on the rules of tele follow-up. They were instructed to report 4 blood sugar values (fasting, 2 hour post breakfast, 2 hour post lunch and 2 hour post dinner) by SMBG once in 3-7 days. Periodicity of tele follow up was determined by severity of diabetes, fluctuations in blood sugars and presence or absence of complications. Dosage titration of medications were carried out by the diabetologist at periodic intervals until the average fasting and post meal values reached below 110 and 135mg% respectively. Each tele conversation offered an opportunity not only for modification of dosages of medications but also for diabetes patient education on self management. Here we present the data of 41 patients who had a regular follow up, on insulins and oral drugs for 2 years, mean age group 54.87(range 32 - 76years) and with an initial mean A1c of 8.35%. The statistical analysis of the result shows that there is a significant reduction in average A1c level from the initial mean of 8.35% to a mean of 6.87% at 3 months ($p=1.35 \times 10^{-9}$) and 5.89% at 2 years ($p=7.191 \times 10^{-16}$). None of the subjects reported symptomatic hypoglycemia during the study period. Regular dosage titration with the help of DTMS based tele follow-up precludes the frequency of hospital visits and is a safe and cost effective method to achieve A1c below 6%, without any risks of serious hypoglycemia when the titration is carried out slowly and steadily at short intervals.

Objective

Efficacy of Diabetes Tele Management System (DTMS) in achieving an A1C goal of <6% without serious Hypoglycemic episodes

Introduction

An A1c below 6%, though considered the ideal target in diabetes management, is not always aimed at in routine clinical practice, due to fear of serious hypoglycemia.

UKPDS has shown that each 1% reduction in mean A1c was associated with 37% reduction in microvascular complications and 21% reduction in the risk of deaths related to diabetes, with the lowest risks associated with A1c below 6%.

In our centre we use a software based Diabetes Tele Management System (DTMS) for those subjects willing for a regular follow up either through the telephone or internet.

Trained staffs, dedicated telephone lines and networked computers enable data collection. Subjects were highly motivated and taught on the rules of tele follow-up.



+ "E" denotes e mail based follow up

"P" denotes e mail phone follow up

Design & Methods

Subjects were highly motivated and instructed to report 4 point blood sugar values (fasting, 2 hour post breakfast, 2 hour post lunch and 2 hour post dinner and 3.00am if required) by SMBG through telephone or e mail or web site once in 3-7 days.

Dosage titration of medications were carried out by the diabetologist at periodic intervals aiming at fasting and post meal values below 110 and 135mg% respectively. 24 hours help line assisted in dealing with queries on monitoring, low sugars, medications etc.,

Each tele conversation with trained DTMS staff in addition offered an opportunity for diabetes patient education on self management, physical activity and healthy food choices.

Results



Fall in A1c as seen in DTMS is also a motivational tool for patients during physical visits

41 patients on insulins and oral drugs on regular follow up for 2 years, mean age group 54.87 (range 32 - 76years) with an initial mean A1c of 8.35%. The statistical analysis of the result shows that there is a significant reduction in average A1c level from the initial mean of 8.35% to a mean of 6.87% at 3 months ($p=1.35 \times 10^{-9}$) and 5.89% at 2 years ($p=7.191 \times 10^{-16}$). None of the subjects reported symptomatic hypoglycemia during the study period.

Fall in Mean A1c during tele titration

Time	Initial	Three Months	Two Year
n	41	41	41
HbA1c	8.35 +/- 0.22	6.94 +/- 0.14	5.90 +/- 0.01

Conclusion

Periodic Tele follow-up of diabetes patients by a group of trained professionals with the help of telephone or internet coupled with soft ware packages should be encouraged.

Titration of medications carried out by the physician based on this information precludes the need for regular physical visits.

This is also a cost effective method for achieving glycemic targets ensuring target A1C below 6% without serious risks of hypoglycemia and prevention of long term complications.

Errors during tele titration can be minimised by

- 1.Motivating and educating the patients
- 2.Selection of dedicated staff
- 3.Careful selection of patients
- 4.Training the staff on responding, recording data and communication skills



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