

The Rule of 15 in the Treatment of Hypoglycaemia; Are People Adhering to This and Does Structured Education Make a Difference?

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Background

It is estimated that 4.5 million people in the UK live with diabetes (Diabetes UK, 2016) and that in their lifetime with the condition, 90% will experience hypoglycaemia (Shafiee, *et al.* 2012). Current UK recommendations for its treatment are to follow the 'rule of 15' (Wiethrop and Cryer, 1993); that involves testing to confirm a blood glucose level of below 4.0mmol/l (Holt, *et al.* 2017), treating with 15g of fast-acting carbohydrate, waiting 15 minutes and re-testing, repeating the process if required (Wiethrop and Cryer, 1993).

The aim of this study was to investigate adherence to the rule of 15 by people with diabetes and their carers and to identify if attendance on a diabetes structured education course influences hypoglycaemia treatment habits and behaviours.

Methods

A cross-sectional study was conducted to identify if adults with diabetes and carers complied with the rule of 15 for hypoglycaemia treatment. 60 people completed an online questionnaire on their hypoglycaemia management and attendance on a structured diabetes education course.

Results

Hypoglycaemia was experienced by 100% (n=60) of participants, who had a mean of 1-3 episodes/ week. Participants who had attended structured diabetes education were 7% more aware (n=15) of the rule of 15 than non-attendees (n=11). Attendees did not have improved hba1c levels when compared to non-attendees. The mean hba1c of participants was 58mmol/mol (7.5%) which was statistically significant in relation to NICE (2016) guidelines of 6.5% (One-sample t-test, t=-26.713, df=59, p=0.001).

Table 1. A Comparison of Hypoglycaemia Treatments Between Attendees and Non-Attendees of Structured Diabetes Education

Attendance	Awareness of Rule of 15	Hypoglycaemia Treatment (g)	Hypoglycaemia Recommendations (g)	Appropriate Treatment Identification (15g)
Attended Structured Diabetes Education 48% (n=29)	Aware= 44% (n=15)	Mean= 21g SD= 7.6g Median= 20g Range= 10g-40g	Mean= 17g SD= 4.2g Median= 15g Range= 12g-30g	15g Treatment Use = 14% (n=4) UK recommendations = 31% (n= 9)
	Unaware= 38% (n=10)			
	Unsure= 12% (n=4)			
Did Not Attend 50% (n=30)	Aware= 37% (n=11)	Mean= 20g SD= 14g Median= 15g Range= 9g-75g	Mean= 15g SD= 3.3g Median= 15g Range= 4-20g	15g Treatment Use = 27% (n=10) UK recommendations = 47% (n= 14)
	Unaware= 40% (n=12)			
	Unsure= 23% (n=7)			
Unsure of Attendance 2% (n=1)	Unaware= 100% (n=1)	15g (n=1) SD =0g	10g SD= 0g	15g Treatment Use = (n=1) UK recommendations = (n= 0)

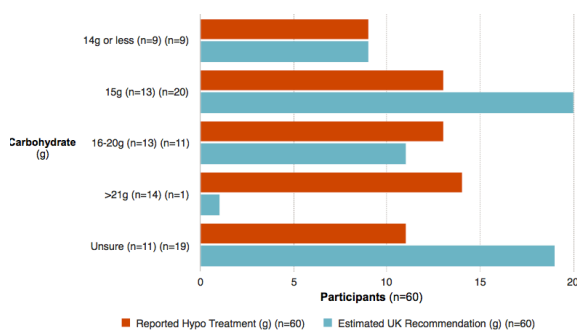
Males (n=13) and females (n=15) were similarly likely to attend a structured diabetes education course (chi-squared, p=0.520, t=1.307, df=2). Those diagnosed 1-5 years (n=12) were least likely to attend and 6-15 years most likely (n=23). Non-course attendees were 17% (n=18) more compliant than attendees (n=13) with always blood glucose testing and waiting 15 minutes. However, used higher carbohydrate treatments, which was not statistically significant (chi-squared, p=0.359, t=10.977 and df= 10).

Table 2. Compliance with the Rule of 15 Amongst Structured Education Course Attendees and Non-Attendees

Measure	Always	Sometimes	Never
Participants (n=30)	43% (n=13)	50% (n=15)	7% (n=2)
Mean Treatment (g)	15g	21g	28g
Carbohydrate Range (g)	10g-35g	15g-35g	15g-40g
Adherence to 15 minute wait	(n=13)	(n=15)	(n=2)
Participants (n=30)	60% (n=18)	33% (n=10)	7% (n=2)
Mean Treatment (g)	24g	14g	13g
Carbohydrate Range (g)	12g-75g	7g-20g	10g-15g
Adherence to 15 minute wait	(n=18)	(n=10)	(n=2)

Sweets were the most frequently used type of carbohydrate (n=17) and mean hypoglycaemia treatment values were 21g (range 10g-40g) and 20g (range 9g-75g) for course attendees and non-attendees respectively, 33% and 40% over 15g UK guidelines (Wiethrop and Cryer, 1993) despite increased awareness (n=20).

Figure 1. A Comparison of Participant Hypoglycaemia Treatment and Estimations of UK Recommendations



Discussion and Conclusion

People who attended structured diabetes education were more likely than those who did not, to be aware of the rule of 15 (chi-squared, p=0.516, t=3.527, df=4). However, the groups were both unlikely to follow recommendations. The mean amount of carbohydrate treatment used was similar across demographics, but the range of preparations used was greater amongst non-attendees, suggesting a requirement for education to promote consistency amongst patients. The role of the diabetes specialist was instrumental in information provision as were mobile apps, highlighting areas whereby structured education might be supported.

In conclusion, structured education plays a central role in raising awareness of the rule of 15, as it supports the patient in making an informed decision on hypoglycaemia treatment and it should be supported by a multidisciplinary approach to diabetes care.

References

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