Infection risk in elderly people with reduced glycaemic control

Johnathan Pearson-Stuttard and colleagues' Review[1] assessed the effect of glycaemic control on infection rates in people with diabetes, concluding that poor control is associated with increased infection rates. The investigators emphasised the paucity of studies specifically analysing the effect of glycaemic control on infection rates in elderly people (age >70 years). This point is particularly important because there is an emerging view that glycaemic control in elderly people can be relaxed,[2,3] since the risks of developing new microvascular and macrovascular complications are substantially lower and the risks associated with hypoglycaemic episodes are often higher than in younger people. Additionally, people with diabetes are at increased risk of death from pneumonia and other infectious diseases,[4] with elderly people being particularly vulnerable. Quantification of any increased infection risk with reduced glycaemic control in this older population with diabetes is therefore particularly important.

We did a large retrospective cohort analysis in 19 806 people aged 65 years or older with diabetes, with infection rates stratified by glycaemic control (appendix). After adjustment for confounders, we noted that poor glycaemic control (HbA_{1c} >8·5% [>69 mmol/mol]) was a significant predictor of rates of pneumonia, urinary tract infections, and skin and soft tissue infections (table).

	n/N (%)	Pneumonia (n=113)		Urinary tract infections (n=1169)		Skin and soft tissue infections (n=1487)	
		Odds ratio	p value	Odds ratio	p value	Odds ratio	p value
Overall HbA_{1c}*	19 456/19 806 (98%)†	1·013 (1·003–1·024)	0·011	1·006 (1·002–1·010)	0·005	1·004 (1·000–1·007)	0·0498
Good glycaemic control (HbA_{1c} <7·0% [<53 mmol/mol])‡	10 516/19 456 (54%)	1	..	1	..	1	..
Moderate glycaemic control (HbA_{1c} 7·0–8·5% [53–69 mmol/mol])‡	6741/19 456 (35%)	1·03 (0·66–1·61)	0·896	1·13 (0·98–1·29)	0·086	1·09 (0·97–1·23)	0·162
Poor glycaemic control (HbA_{1c} >8·5% [>69mmol/mol])‡	2199/19 456 (11%)	2·38 (1·44–3·93)	<0·0007	1·28 (1·06–1·55)	0·012	1·30 (1·10–1·54)	0·002

*Models using HbA_{1c} as a linear variable. †We excluded patients whose most recent HBA_{1c} measurements were from more than 3 years before Jan 1, 2014. ‡Models using HbA_{1c} as a categorical variable.

***Table*: Association between HbA_{1c} value and risk of infections during a 1 year follow-up period (2014) in older people with diabetes, stratified by baseline glycaemic control and adjusted for demographics and comorbidities**

These findings emphasise the effect of poor glycaemic control on rates of potentially life-threatening infections in the older population. The trend towards relaxation of glycaemic control in elderly people might result in increased infection rates and possibly increased rates of hospital admission, morbidity, and mortality caused by infections. We agree with Pearson-Stuttard and colleagues that further research is needed, with quantification of any effect on morbidity and mortality. Increased infection risk should be considered when relaxing glycaemic targets in elderly people.

APM wrote the article and did the analysis. JH prepared the data. SdL and JH both contributed to the final article. APM and SdL have received funding from Eli Lilly as part of the University of Surrey-Lilly Real World Evidence (RWE) projects. This centre is funded by Eli Lilly Pharmaceuticals. Eli Lilly are updated periodically with the research done as part of the RWE projects, although these funders had no role in development of this protocol. JH received funding from Eli Lilly Pharmaceuticals to undertake research.

*Andrew P McGovern, Julia Hine, Simon de Lusignan
a.mcgovern@surrey.ac.uk

Department of clinical and experimental medicine, University of Surrey, Guildford GU2 7PX, UK (APM, JH, SdL)

1 Pearson-Stuttard J, Blundell S, Harris T, Cook DG, Critchley J. Diabetes and infection: assessing the association with glycaemic control in population-based studies. *Lancet Diabetes Endocrinol* 2016; **4:** 148–58.
2 Kirkman MS, Briscoe VJ, Clark N, et al. Diabetes in older adults: a consensus report. *J Am Geriatr Soc* 2012; **60:** 2342–56.
3 Sinclair AJ, Paolisso G, Castro M, et al. European Diabetes Working Party for Older People 2011 clinical guidelines for type 2 diabetes mellitus. Executive summary. *Diabetes Metab* 2011; **37** (suppl 3): S27–38.
4 Emerging Risk Factors Collaboration, Seshasai SR, Kaptoge S, Thompson A, et al. Diabetes mellitus, fasting glucose, and risk of cause-specific death. *N Engl J Med* 2011; **364:** 829–41.

Lancet Diabetes Endocrinol 2016
Published Online February 16, 2016 http://dx.doi.org/10.1016/S2213-8587(16)00043-7

See Online for appendix