Incidence rates of critical low glucoses (<40 mg/dL) by POCT before and after new policies for treatment of clinically significant hypoglycemia (<54 mg/dL): A comparison between two hospitals

Lilah M. Evans[1], D.F. Stickle[1,2], Barbara M. Goldsmith[1,2]

1.Thomas Jefferson University Hospitals, Philadelphia, PA, USA; 2.Thomas Jefferson University, Philadelphia, PA, USA

BACKGROUND

Glucose <54 mg/dL was recently defined as Clinically Significant Hypoglycemia (CSH, American Diabetes Association, Standards of Medical Care in Diabetes, 2017). In January 2018, our hospitals instituted a call-back policy for inpatient CSH from the central laboratory, and instituted a new nursing procedure for response to CSH. We examined whether the new policies had affected the incidence rate of low glucose critical values (CRITICAL, <40 mg/dL) among POCT glucose measurements. This was investigated for two hospitals within our system: A, a 950-bed academic medical center hospital, and B, a 200-bed community hospital.

METHODS

POCT glucose results (Roche Accuchek) for two 12 week intervals before (PRE) and after (POST) the policy change date were obtained from the POCT reporting system for both hospitals. Incidence quotients (Q, defined as results either in category of CRITICAL or CSH per total number of glucose results in interval) were tabulated by Excel spreadsheet for PRE and POST dataset analyses.

RESULTS

Analyses were performed for four datasets (table below). The most important statistic is a comparison of the number of unique patients experiencing one or more CRITICALS in intervals PRE and POST. Q among unique patients having one or more CRITICALS was significantly increased in POST for hospital A.

CONCLUSIONS

After adoption of new CSH policies, the incidence quotient (Q) for CRITICAL glucoses by POCT increased significantly at hospitals A and B by 26% and 28%, respectively ($p<0.01$). Q for unique patients having one or more CRITICALS increased at hospital A by 17% ($p<0.01$) and at hospital B by 7% (not significant). Presumably, the increases reflect increased awareness of circumstances in which CSH may develop, leading to a significantly higher selection rate for measurement of CRITICAL glucoses by POCT. POCT for glucose clearly plays an important role in response to CSH at both hospitals.

	Hospital A 950-bed academic medical center hospital			**Hospital B 200-bed community hospital**		
	PRE	**POST**	**Comments: POST compared to PRE**	**PRE**	**POST**	**Comments: POST compared to PRE**
Total	*n= 76,745* (6,450 patients)	*n= 78,838* (6,507 patients)		*n= 16,954* (2,434 patients)	*n= 19,779* (2,589 patients)	
Critical	*n= 169* (97 patients) Q (Criticals): 2.20E-3	*n= 218* (116 patients) Q (Criticals): 2.77E-3	Q increased by 26%	*n= 26* (16 patients) Q (Criticals): 1.53E-3	*n= 39* (20 patients) Q (Criticals): 1.97E-3	Q increased by 28%
CSH	*n= 613* (318 patients) Q (CSH): 7.99E-3	*n= 769* (328 patients) Q (CSH): 9.75E-3	Q increased by 22%	*n= 101* (59 patients) Q (CSH): 5.95E-3	*n= 110* (54 patients) Q (CSH): 5.56E-3	Q decreased by 7%
Unique patients (one or more critical results)	*n= 97* Q (Unique): 1.26E-3	*n= 116* Q (Unique): 1.47E-3	Q increased by 17%	*n= 16* Q (Unique): 0.94E-3	*n= 20* Q (Unique): 1.01E-3	Q increased by 7%

Am Assoc Clin Chem, Anaheim, August 2019