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Diabetes mellitus and hypoglycemia as a complication of intravenous insulin to treat hyperkalemia in the ED

We read with interest the article by Scott NL et al. "Hypoglycemia as a complication of intravenous insulin to treat hyperkalemia in the emergency department" that have been published in the American Journal of Emergency Medicine [1]. This interesting retrospective study reports on the rate of hypoglycemia following intravenous insulin treatment for hyperkalemia in the emergency department setting and furthermore describes which variables were independently associated with this outcome: Lower glucose level prior to insulin administration, higher doses of administrated insulin and lower doses of administered 50%dextrose were independently associated with hypoglycemia in the multivariate analysis. Age, history of diabetes, and history renal failure were not independently associated.

The authors of the study have collected and analyzed a large amount of data, leading to interesting debate. Nevertheless, we would like to address them one question that may contribute to further, more detailed discussion of the issue.

The authors as well as in several other studies [2,3], involved diabetes mellitus into the analysis as one disease. But diabetes mellitus is a group of metabolic diseases resulting from various pathogenic defects which may be treated by different ways and therefore a risk of hypoglycemia may differ between individual patients.

Based on our clinical experience we can speculate that the highest risk of hypoglycemia after insulin administration due to treatment of hyperkalemia is associated with type 1 diabetes patients. The main reasons for our believe are 1) these patients are at higher risk of hypoglycemia due to insulin treatment itself simply said due to failure to clear circulating insulin during hypoglycaemia (this may probably explain 4% of patients experiencing hypoglycemia without i.v. insulin administration mentioned in the study) and hyperkalemia related insulin dose may interfere with previously injected insulin by a patient; 2) lower glucose threshold for release of counterregulatory hormones; and (4) loss of normal pancreatic alpha cell responses [4]; 3) impaired awareness of hypoglycaemia which may be present in 30% and even more patients [4-6], 4) usually good insulin sensitivity [4] (making them more sensitive to even smaller doses of insulin, moreover if they are added to their regular daily doses).

Therefore we believe that it would be interesting to analyze this group of patients to evaluate the risk of hypoglycemia related to hyperkalemia treatment with insulin separately. Because above mentioned disorders 1–3 are also to some extent presented in type 2 diabetes patients [4,7], those treated with insulin or sulphonylurea derivates could also be an interesting focus on analysis.

We, with great respect, suggest taking these comments into the account and also consider them, if the continuation of the study is planned.

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Conflict of interest statement

The authors do not have any conflicts of interest to declare.

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Endotracheal intubation in the prehospital settings☆

To the Editor,

In a retrospective review, Alter et al. [1] compared Macintosh vs Miller blade for endotracheal intubation (ETI) with direct laryngoscopy (DL) in prehospital settings. The authors conclude that curved blades had higher first attempt and overall success rates when compared to straight blades.

We would like to add several appreciations. First, the difference to the number of uses between the two blades may have constituted a relevant bias since operators may have significantly more experience with the Macintosh compared to the Miller blade. This situation may have conditioned the results. Second, the authors do not add relevant information such as the success of each blade as a rescue device, which rescue device was used when DL failed or the number of intubations performed with a video laryngoscope (VL) as a primary device during the study period. Likewise, it is necessary to take into account different considerations. Limiting the number of attempts (maximum of three attempts) to achieve a timely nontraumatic ETI is the main goal in airway management. [2] Therefore, it is important to make the first attempt in the best conditions and with the device with the highest likelihood of success in order to prevent airway trauma and progression to a "cannot intubate, cannot oxygenate" situation. Thus, the Vortex approach tries to synthesize this safe practice. [3] Prehospital airway management is especially difficult with a high risk of failure. [4] VLs offer, in all settings, a better glottic view and greater ease of use, allow a higher number of ETIs in the first attempt, and reduce the number of failed intubations and complications when compared with DL. [5] Consequently, guidelines recommend that VLs, as well as second-generation laryngeal masks, should be available in all the situations in which the airway is managed, and providers should be appropriately trained in its use. [2] Video laryngoscopy should be considered when DL fails or is expected to be difficult. [2,6] Evidence highlights the importance of training and the kind of selected VL in success of the ETI. In fact, VLs with hyperangulated blade can prolong easy ETIs. [7] Difficult Airway Society suggest the use of video laryngoscopy as first choice for all ETI of the critically ill patient to avoid multiple attempts and reduce failed intubations: use of a VL that enables use both as a direct laryngoscope and as a VL (i.e. Macintosh-type blade) in easy airways; and a hyperangulated device used with a stylet or bougie as a primary device to treat difficult airways or as a rescue device. These recommendations could be extended to prehospital ETI. The McGrath MAC video laryngoscope is an ideal device because of it allows to use both types of blades and its feasibility for prehospital use. [8] Nonetheless, published data on video laryngoscopy in prehospital airway management are limited and generally of poor quality. [6] The research on airway management must overcome classic goals and focus the strivings in this field. Randomized prehospital control trials addressing video laryngoscopy versus direct laryngoscopy are necessary to expand the body of evidence.

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