

CLINICAL EFFECTIVENESS OF THE CORRECTED NEX DISTANCE FORMULA IN DETERMINING THE INTERNAL LENGTH OF NG TUBES

Background

Correct determination of the internal length of a nasogastric tube (NGT) is of utmost importance before the tube can be inserted blindly (i.e. without direct visual guidance from technology), a procedure frequently performed by nurses. The nose-earlobe-xiphoid (NEX) distance formula is commonly used for this purpose. However, this method lacks robust evidence to support its accuracy.¹ A recent randomized controlled trial introduced an alternative, the corrected NEX distance formula, tested preliminarily in an observational study.^{2,3} However, applicability of this research-based formula in standard clinical practice remains uncertain.

Aim(s)

This study aimed to evaluate the real-world clinical effectiveness of the corrected NEX distance formula for NGT length determination in adult patients in hospital or intensive care units.

Methods

This monocentric retrospective clinical effectiveness study utilized routinely collected observational data from adult patients (≥ 18 years) admitted to a general hospital, and requiring nasogastric tube placement between October 2020 and November 2022 ($n = 358$). The primary outcome assessed NGT tip positioning (with a correct tip position >3 cm below the lower esophageal sphincter) by an advanced practice nurse (APN) through X-ray verification. Additionally, secondary outcome data, obtained from patient records, related to tip position reporting by reviewing radiologists, were collected from a random subset of 100 participants.

Results

All NGT tips achieved correct positioning, remaining more than 3 cm below the LES. In the subset of 100 NGTs, the X-ray protocols, as documented by the reviewing radiologists, exhibited varying levels of reporting clarity regarding the tube tip. Specifically, these protocols indicated no report of the tube tip in 4.0% of cases, ambiguous descriptions in 33.0% of cases, and unambiguous reporting in 63.0% of cases.

Discussion

Study results for the primary outcome are consistent with those of previous efficacy research, thus providing valuable support for the corrected NEX distance formula.³ The application of this formula has the potential to mitigate both over- and underestimation of the internal length of nasogastric tubes (NGTs). Although this study did not examine the impact of over/underestimation of the internal length on adverse events, using the corrected formula could be beneficial in this regard. The lack of clarity in radiologist reports may be due to the absence of a diagnostic question on the request form, or insufficient training in reporting style and technique.^{4,5} Therefore, it is recommended to utilize a checklist for assessing the positioning of a NGT on an X-ray.⁵ This study had limitations: it was conducted at a single center, included only patients with X-ray-verified NG tube placement, lacked power analyses, and may have had confirmation bias. These limitations should be considered when interpreting the results.

Implications and future perspectives

The corrected NEX distance formula can be considered a safer alternative for determining the internal length of NGTs compared to other established measurement methods or formulas, whether evidence-based or not. Nevertheless, conducting multicenter studies comparing different formulas for determining the internal length of NGTs will help increase the existing but limited evidence base regarding this critical facet of NGT placement procedures. In addition, we advocate the development of a framework (including a checklist) that allows radiologists to unambiguously report the tip position of NGTs in their report.

References

1. Taylor SJ, Allan K, McWilliam H, Toher D. Nasogastric tube depth: The “NEX” guideline is incorrect. *British Journal of Nursing*. 2014;23(12):641-644. doi:10.12968/bjon.2014.23.12.641
2. Torsy T, Saman R, Boeykens K, Duysburgh I, Van Damme N, Beeckman D. Comparison of Two Methods for Estimating the Tip Position of a Nasogastric Feeding Tube: A Randomized Controlled Trial. *Nutrition in Clinical Practice*. 2018;33(6):843-850. doi:10.1002/ncp.10112
3. Torsy T, Saman R, Boeykens K, et al. Accuracy of the corrected nose-earlobe-xiphoid distance formula for determining nasogastric feeding tube insertion length in intensive care unit patients: A prospective observational study. *Int J Nurs Stud*. 2020;110:103614. doi:10.1016/j.ijnurstu.2020.103614
4. Cohen MD, Ellett M. Quality of Communication: Different Patterns of Reporting the Location of the Tip of a Nasogastric Tube. *Acad Radiol*. 2012;19(6):651-653. doi:10.1016/j.acra.2012.02.007
5. Wallis A, McCoubrie P. The radiology report — Are we getting the message across? *Clin Radiol*. 2011;66(11):1015-1022. doi:10.1016/j.crad.2011.05.013