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LETTER TO THE EDITOR

What is the optimal management of dysphagia in metastatic esophageal cancer?

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Hanna *et al.*[1] investigated the improvement in dysphagia score (DS) in inoperable esophageal cancer treated with endoluminal stenting or radiation therapy. They defined DS ≤ 1 at the 10-week follow-up mark as acceptable resolution of dysphagia, and they claimed a statistically significant improvement in the whole sample and in both treatment groups.

The paper is interesting, but there is a weak point in the statistical analysis that could affect the results, because they compared paired data (rate of patients with DS = 1 at presentation versus rate of patients with DS ≤ 1 in follow-up) using the Fisher test instead of the McNemar test[2].

The authors reported only percentages and not numbers of patients associated to DS levels, but using some math skills and knowledge of the McNemar test formula, we gather the correct result from the available information for the whole sample.

Let's define the standard 2×2 contingency table used with the McNemar test:

- A is the number of subjects with DS ≤ 1 both at presentation and at 10 weeks
- B is the number of subjects with DS ≤ 1 at presentation and DS > 1 at 10 weeks ("aggravations")
- C is the number of subjects with DS > 1 at presentation and DS ≤ 1 at 10 weeks ("improvements")
- D is the number of subjects with DS > 1 both at presentation and at 10 weeks

Using marginal percentages and the sample size reported in the paper, we derive

$(A + B) = 32$,
$(C + D) = 31$,
$(A + C) = 57$, and
$(B + D) = 6$

for the whole sample. With some calculations, we obtain $(C - B) = 25$. B is included in interval [0,6]; C, in [25,31]; and so $(B + C)$, in [25,37]. Because $(B + C)$ is the denominator of the McNemar statistic, the values of B and C are inversely related.

Therefore, the smallest value of the McNemar statistic occurs when $(B + C) = 37$, and it means that $A = 26$, $B = 6$, $C = 31$, $D = 0$ (31 improvements and 6 aggravations; McNemar statistic: 17.57; $p < 0.0001$). The highest value occurs when $(B + C) = 25$, and it means that $A = 32$, $B = 0$, $C = 25$, $D = 6$ (25 improvements and 0 aggravations; McNemar statistic: 23.04; $p < 0.0001$).

We are finally able to prove the statistically significant improvement in DS at 10 weeks in the whole sample and to show the correct outcome.

However, the small sample size of endoluminal stenting group (13 subjects) is not suitable to demonstrate any improvements: in fact, using the abovementioned approach, we obtain 2.25 as highest value of the McNemar statistic ($p = 0.13$).

In the end, given that the statistical analysis did not entirely support the authors' conclusions, the discussion of these results should take in account that incertitude.

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CONFLICT OF INTEREST DISCLOSURES

The authors have no financial conflicts of interest to declare.

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