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Letter to the Editor

Comments on the utilization of Mann-Whitney U test and Kaplan-Meier method

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Conflict of Interest
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▸ See the article "Total laparoscopic vs. conventional open abdominal nerve-sparing radical hysterectomy: clinical, surgical, oncological and functional outcomes in 301 patients with cervical cancer" in volume 32, number 1, e10.

We read the paper by Ceccaroni et al. [1] with interest. The authors performed a cohort study including 301 patients; 170 in the total laparoscopic nerve-sparing radical hysterectomy (TL-NSRH) group and 131 in the open abdominal nerve-sparing radical hysterectomy (OA-NSRH) group. Their study showed that TL-NSRH is feasible, safe and effective, and conjugates adequate radicality and improvement in postoperative functional outcomes. Although we appreciate and agree with most of the content of the article, we would like to raise some issues that can affect the interpretation of results.

First, in the clinical standards, the participants in this study were stratified by operation approaches (TL-NSRH) and OA-NSRH), age and BMI were shown in baseline characteristics of the patients. However, the primary cause of cervical cancer, human papillomavirus (HPV) infection, and related high-risk factors including early sexual life, multiple sexual partners, smoking, low socioeconomic status, malnutrition and so on [2], which are known to affect the development of cervical cancer were not displayed in detail. These categories may affect the reliability of the grouping, and we believe that the omission of these data from the results limits confidence in the research results.

These categories would have been more relevant for frequency-matching than some of the more arbitrary groups chosen in this study, and the missing of this data in Table 1 limits the reliability of the findings.

Second, in the Statistical analysis section, the Students' t-test and Mann-Whitney U test were used for comparison of continuous variables as appropriate. There may also be the problem of uneven variance in the double-sample t-test in Table 1, and the combined variance needs to be modified to make the statistics better meet the t-distribution. At present, it is generally accepted that the core method of Welch' analysis of variance (ANOVA), is to give different weights according to different variances to reduce the impact of different variances on F statistics, and non-parametric test (Mann-Whitney test) is not recommended [3]. Therefore, we recommend that the author consider replacing Mann-Whitney U test with Welch' ANOVA in the statistical analysis.

Finally, in Figs. 1 and 3, the disease-free survival (DFS) of the study cohort according to the surgical approach (laparoscopic and laparotomy surgeries) and DFS in early-stage disease were calculated via the Kaplan-Meier method. The corresponding p-value was computed using the log-rank (Mantel-Cox) test. However, we observed that the survival curves of these 2 pictures cross each other. The application condition of the log-rank test is that the survival curve of each group has a proportional risk relationship, the survival curve of each group can not be crossed, it indicates that there are confounding factors when the survival curve is crossed. If the influence of only one factor is analyzed, piece-wise analysis log-rank test [4] or Tarone-Ware test can be used. These results (Fig. 1: p=0.15; Fig. 3: p=0.33) may appear more significant if the above suggestion can be adopted by the author.

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