**Supplementary Material 3. Statistical methods for determination of sample size and power calculations**

The following statistical analysis was conducted to estimate the optimal sample size for this study.

The primary goal of this study was to evaluate predictive factors of response to one and/or 3 months of proton pump inhibitor and lifestyle modification treatment (the response to treatment was defined as more than 50% improvement of total RSI compared to pre-treatment baseline) by using multivariate logistic regression analysis by the forward conditional method. To estimate the power of a specific predictor in multivariate logistic regression analysis, following information are required; 1) the ratio of the outcome of interest for the reference group, 2) the ratio of the reference group, 3) odds ratio, and 4) the squared multiple correlation coefficient with other control variables (R2).

According to an observational study of adult patients with LPRD, the proportion of patients who improved more than 50% in terms of total RSI score at 1 month compared to baseline was 30%, and 75% at 3 months [1]. However, a comprehensive prospective analysis of the relationship between the potential predictive factors and adult Korean patient with LPRD has not been performed. Therefore, statistical power was calculated under different assumptions on specific conditions that were used, such as odds ratio (which indicates the magnitude of the effect of the predictive variable). The following conditions were used to calculate the statistical power.

* Odds ratios: 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 5.0
* Ratio of the reference group: 0.15, 0.25, 0.40
* R2: 0.05, 0.10, 0.20

The varied combinations of above conditions were entered into statistical power calculating software (G\*Power, V3.1) to verify and estimate the optimal sample size with a statistical power of more than 80%, and a two-tailed P-value of <0.05 was considered statistically significant. Among the calculated results, only the case where the R2 value was 0.20 is summarized in the following Tables 1 and 2. The reason for choosing R2 value of 0.20 was that even though the power magnitude decreased as the R2 values are larger, the difference was not significant.

**Table 1.** Power simulations for the outcome of 1 month total RSI goal attainment by alternative odds ratios from 1.5 to 5.0 and the distribution of reference group for the explanatory variable of interest from 0.15 to 0.40 at 0.05 2-sided significance level

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Sample** | **OR=1.5** | **OR=2.0** | **OR=2.5** | **OR=3.0** | **OR=3.5** | **OR=4.0** | **OR=5.0** |
| **Size** |  |  | **Ratio of the reference group = 0.15** | | | |  |
| 220 | 0.1621 | 0.3707 | 0.5684 | 0.7164 | 0.8165 | 0.8808 | 0.9478 |
| 320 | 0.2099 | 0.4953 | 0.7245 | 0.8605 | 0.9312 | 0.9660 | 0.9912 |
| 420 | 0.2573 | 0.6026 | 0.8309 | 0.9354 | 0.9762 | 0.9912 | 0.9987 |
|  |  |  | **Ratio of the reference group = 0.25** | | | |  |
| 220 | 0.2065 | 0.4927 | 0.7256 | 0.8638 | 0.9347 | 0.9688 | 0.9925 |
| 320 | 0.2756 | 0.6450 | 0.8686 | 0.9577 | 0.9871 | 0.9961 | 0.9996 |
| 420 | 0.3428 | 0.7595 | 0.9410 | 0.9881 | 0.9977 | 0.9996 | >0.9999 |
|  |  |  | **Ratio of the reference group = 0.40** | | | |  |
| 220 | 0.2416 | 0.5823 | 0.8206 | 0.9325 | 0.9760 | 0.9916 | 0.9989 |
| 320 | 0.3279 | 0.7436 | 0.9350 | 0.9866 | 0.9975 | 0.9995 | >0.9999 |
| 420 | 0.4101 | 0.8498 | 0.9785 | 0.9977 | 0.9998 | >0.9999 | >0.9999 |

**Table 2.** Power simulations for the outcome of 3 months total RSI goal attainment by alternative odds ratios from 1.5 to 5.0 and the distribution of reference group for the explanatory variable of interest from 0.15 to 0.40 at 0.05 2-sided significance level

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Sample** | **OR=1.5** | **OR=2.0** | **OR=2.5** | **OR=3.0** | **OR=3.5** | **OR=4.0** | **OR=5.0** |
| **Size** |  |  | **Ratio of the reference group = 0.15** | | | |  |
| 220 | 0.0990 | 0.1861 | 0.2678 | 0.3360 | 0.3905 | 0.4335 | 0.4935 |
| 320 | 0.1301 | 0.2695 | 0.3980 | 0.5005 | 0.5786 | 0.6372 | 0.7151 |
| 420 | 0.1620 | 0.3530 | 0.5195 | 0.6418 | 0.7272 | 0.7862 | 0.8569 |
| **Ratio of the reference group = 0.25** | | | | | | |  |
| 220 | 0.1377 | 0.2883 | 0.4256 | 0.5339 | 0.6152 | 0.6758 | 0.7553 |
| 320 | 0.1859 | 0.4113 | 0.5968 | 0.7237 | 0.8061 | 0.8594 | 0.9182 |
| 420 | 0.2349 | 0.5242 | 0.7303 | 0.8480 | 0.9115 | 0.9460 | 0.9768 |
|  |  |  | **Ratio of the reference group = 0.40** | | | |  |
| 220 | 0.1787 | 0.3907 | 0.5685 | 0.6939 | 0.7782 | 0.8347 | 0.9000 |
| 320 | 0.2426 | 0.5376 | 0.7427 | 0.8575 | 0.9186 | 0.9514 | 0.9801 |
| 420 | 0.3061 | 0.6596 | 0.8554 | 0.9393 | 0.9734 | 0.9876 | 0.9967 |

The sample size with a statistical power of more than 80% was considered as an optimal sample size. According to above methods, a sample size of 320 patients was calculated as sufficient. Anticipating a 20% dropout rate, recruitment of 400 patients was planned for this study.

**REFERENCE**

1. Shin MH, Nam SY, Park YH, Son YI. Open-label observational study for evaluating the short-term benefits of rabeprazole medication on laryngopharyngeal reflux. Clin Exp Otorhinolaryngol. 2012 Mar;5(1):28-33.