Correction to: CT compared to MRI for functional evaluation of the right ventricle: a systematic review and meta-analysis

Hang Fu¹ · Xuedong Wang² · Kaiyue Diao³ · Shan Huang³ · Hui Liu¹ · Yue Gao³ · Qin Zhao³ · Zhi-gang Yang³ · Ying-kun Guo¹

Published online: 25 March 2020
© European Society of Radiology 2020

Correction to: European Radiology (2019) 29:6816–6828
<https://doi.org/10.1007/s00330-019-06228-2>

The original version of this article, published on 27 May 2019, unfortunately contained mistakes. After reviewing the published research, the authors found that they misused the weighted method in Stata software. The weighted method based on sample size was the right method to do this meta-analysis, as they have written in the “Methods.” The quantitative results that need to be corrected are in the “Results” section of the Abstract, the “Quantitative analysis” section of the “Results,” Table 2, Fig. 3, and Fig. 5. Compared with the results in the original published paper, only the specific values of the quantitative pooled results of each right ventricle function parameter changed slightly. However, the final conclusion was not affected. The correct values that belong in the Results, figures, and table are shown in this correction. The corrected Table 2, Fig. 3, and Fig. 5 are given below. These corrections have no impact on the final conclusion of the study. The authors sincerely apologize for these errors and the inconvenience caused by them.

Correction for values in Results of abstract

Results: Sixteen studies that used disk summation (637 subjects) and three studies that used three-dimensional reconstruction were included. For the 16 studies, the pooled standard mean differences (95% limit of agreement) were 2.97 (−4.96, 10.91) for EDV, 4.05 (−4.79, 12.88) for ESV, −1.42 (−6.93, 4.10) for RVEF, and −0.05 (−9.06, 8.95) for SV. The overall correlation coefficient (*r*) values were 0.88 for EDV, 0.89 for ESV, 0.83 for RVEF, and 0.84 for SV. The mean difference between the two methods was not statistically significant (overall effect *Z* test, *p* > 0.1).

Correction for values in Quantitative results

The included studies reported a wide range of RVF index values, with RVEF ranging from 24 to 58.7%, EDV 80–172.7 ml, ESV 15.5–131 ml, and SV 37–99.2 ml. Five papers reported EDV, ESV, and RVEF but not SV [20, 26, 32, 33, 39]. One study reported a comparison between

The online version of the original article can be found at <https://doi.org/10.1007/s00330-019-06228-2>

✉ Zhi-gang Yang
yangzg666@163.com

✉ Ying-kun Guo
gykpanda@163.com

¹ Department of Radiology, Key Laboratory of Obstetric & Gynecologic and Pediatric Diseases and Birth Defects of Ministry of Education, West China Second University Hospital, Sichuan University, 20# Section 3 South Renmin Road, Chengdu 610041, Sichuan, China

² Key Laboratory of Obstetric & Gynecologic and Pediatric Diseases and Birth Defects of Ministry of Education, West China Second University Hospital, Sichuan University, Chengdu 610041, Sichuan, China

³ Department of Radiology, National Key Laboratory of Biotherapy, West China Hospital, Sichuan University, 37# Guo Xue Xiang, Chengdu 610041, Sichuan, China

two subgroups: normal subjects versus patients with mitral valve regurgitation [37]. This amounted to two specific cohorts.

The pooled results for all 19 studies were summarized below. The overall MD (and LOA) were 6.07 (−1.96, 14.10) for EDV, 6.01 (−2.25, 14.27) for ESV, −1.73 (−6.59, 3.12) for RVEF, and 0.90 (−7.38, 9.19) for SV, with mild heterogeneity (15.6% for EDV and 3.5% for ESV).

Subgroup analysis was conducted according to the CT scanning algorithm used. Among the included studies, 16 applied disk summation and 3 applied 3D reconstruction. Heterogeneity was negligible for all RVF indexes among the 16 studies that employed disk summation. The pooled results (95% LoA) were as follows: 2.97 (−4.96, 10.91) for EDV, 4.05 (−4.79, 12.88) for ESV, −1.42 (−6.93, 4.10) for RVEF, and −0.05 (−9.06, 8.95) for SV. The pooled results of the 3 studies that applied 3D reconstruction were 23.54 (−5.42, 52.50) for EDV, 17.16 (−5.82, 40.13) for ESV, −3.54 (−12.01, 4.93) for RVEF, and 6.51 (−14.38, 27.40) for SV. The homogeneity of the pooled results was excellent.

Among the 16 studies that used disk summation, we conducted subgroup analysis to determine the effect of CT scanner slice/detector number < 64 (subgroup A) or ≥ 64 (subgroup B). The overall results and heterogeneity are presented in Table 2. The overall MD (and LOA) of subgroup B were 1.27 (−8.50, 11.05) for EDV, 1.68 (−10.31, 13.7) for ESV, −0.56 (−8.44, 7.33) for RVEF, and 0.36 (−11.1, 11.8) for SV. For subgroup A, the pooled results were 6.66 (−9.83, 23.15) for EDV, 8.64 (−6.50, 23.78) for ESV, −3.17 (−10.87, 4.52) for RVEF, and 0.26 (−12.66, 13.18) for SV.

The overall heterogeneity of all 19 studies was greatly affected by the 3 studies that applied a 3D reconstruction algorithm. When the 3 studies were excluded, the heterogeneity decreased, and the pooled results of all RVF indexes improved (Fig. 3). In addition, a funnel plot (Fig. 4) suggested that one of the 3 studies may have publication bias. Although there was a marked variation in the correlation coefficient for each RVF index across studies, the overall results indicated a strong relationship between CT and MRI measures of EDV (0.88 [0.86, 0.90]), ESV (0.89 [0.87, 0.91]), RVEF (0.83 [0.80, 0.85]), and SV (0.84 [0.81, 0.86]) (forest plots shown in Fig. 5).

Correction for values in Table 2

Table 2 Pooled results and heterogeneity of the 4 indexes in our meta-analysis

	EDV		ESV		RVEF		SV	
	Overall results	Heterogeneity (%)	Overall results	Heterogeneity (%)	Overall results	Heterogeneity (%)	Overall results	Heterogeneity (%)
19 studies	6.07 (−1.96, 14.10)	15.6	6.01 (−2.25, 14.27)	3.5	−1.73 (−6.59, 3.12)	0.0	0.90 (−7.38, 9.19)	0.0
16 studies	2.97 (−4.96, 10.91)	0.0	4.05 (−4.79, 12.88)	0.0	−1.42 (−6.93, 4.10)	0.0	−0.05 (−9.06, 8.95)	0.0
3 studies	23.54 (−5.42, 52.50)	0.0	17.16 (−5.82, 40.1)	0.0	−3.54 (−12.01, 4.93)	0.0	6.51 (−14.4, 27.4)	0.0
Subgroup A	6.66 (−9.83, 23.15)	0.0	8.64 (−6.50, 23.78)	0.0	−3.17 (−10.87, 4.52)	0.0	0.26 (−12.7, 13.2)	0.0
Subgroup B	1.27 (−8.50, 11.05)	0.0	1.68 (−10.31, 13.7)	0.0	−0.56 (−8.44, 7.33)	0.0	0.36 (−11.1, 11.9)	0.0

Correction for Fig. 3 and Fig. 5

Fig. 3 **a** Forest plots of RVEF in all 19 studies; **(b)** Forest plots of RVEF in 16 studies using disk summation; **(c)** Forest plots of RVEF in 3 studies using 3D reconstruction; **(d)** Forest plots of RVEF in subgroups based on slices of CT scanner of the 16 studies as defined before

Fig. 5 Forest plots of correlation coefficient of EDV, ESV, RVEF, and SV measured by CT and MRI in all included studies

Publisher's note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.