

Comparative Effectiveness of Home- versus Center-Based Cardiac Rehabilitation Following Heart Transplantation



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To the Editor,

We recently had the privilege to read the article entitled “Effectiveness of Exercise-Based Cardiac Rehabilitation for Heart Transplant Recipients: A Systematic Review and Meta-Analysis” by Costa et al.¹

The recently published article was a meta-analysis of 11 randomized controlled trials with 296 heart transplant (HTx) recipients included which aimed to compare functional capacity and exercise tolerance measured with VO₂ peak as the primary outcome of interest between the patients undergoing exercise-based cardiac rehabilitation (CR) and usual care (UC). There were 3 studies with home-based (HB) CR included whereas 7 trials had a conventional center-based (CB) CR. The training programs were either moderate intensity continuous training with/without resistance training or high intensity interval training. The results of the meta-analysis showed a statistically significant improvement in exercise tolerance in patients receiving exercise-based CR (mean difference (MD) (95% confidence interval (CI))=3.03 [2.28, 3.77], *P*<.00001). As outlined by the authors as well, functional capacity can be considered as a marker of prognosis in HTx patients. Also, the need to continue exercise training

programs was emphasized and it was mentioned that this may be enabled using HB exercise training programs. As we know, HTx recipients are among the immunocompromised patients being at higher risk of infections such as pneumonia being a frequent source of infection and a leading cause for increasing the burden of the condition.² Thus, we believe that application of HB rehabilitation programs with possible utilization of telehealth features for patients receiving HTx is of great importance.

In this regard, we performed a subgroup analysis to investigate if HB programs are as effective as CB rehabilitation in HTx recipients. Our results showed a significant improvement in VO₂ peak in CB programs (MD (95% CI)=3.65 [2.33; 4.96]) whereas HB programs had a marginally non-significant effect on functional capacity (MD (95% CI)=2.26 [-0.12; 4.63]) (Figure 1). Few limitations should be taken into account in interpretation of these results. First, the number of studies with HB programs were limited. The use of telehealth was not mentioned in almost all of these HB programs. All of the studies with HB programs were conducted before 2010 with no well-designed protocols. Also, the adherence of these HB programs could not be evaluated

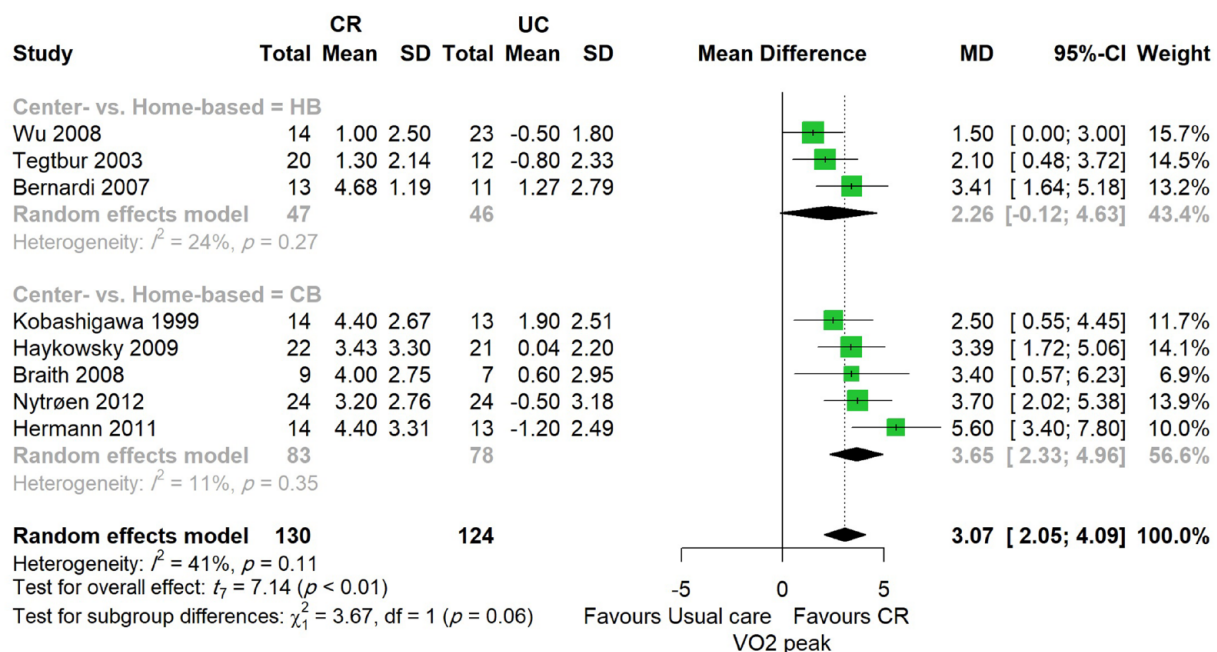


Figure 1. Forest plot showing subgroup analysis comparing the peak oxygen consumption (VO₂ peak) based on home- and center-based studies. Abbreviations: CB, center-based; CI, confidence interval; CR, cardiac rehabilitation; HB: home-based; SD, standard deviation; MD, mean difference.



completely as no appropriate follow-ups and telerehabilitations were performed.

It has been demonstrated that adoption of HB telerehabilitation appeared acceptable compared to the CB cardiac rehabilitation in patients with coronary artery disease as HB telerehabilitation is as effective as CB rehabilitation programs and both interventions are superior to UC.³ Following the COVID-19 pandemic and its impact of healthcare systems, many center-based cardiac rehabilitation (CBCR) programs were closed or partially closed and this, highlighted a prompt need for application of home-based CR programs and virtual care.^{4,5} As mentioned earlier, HTx recipients, which are among the susceptible members of the communities, are at higher risk of contracting respiratory infections including COVID-19 and influenza. Thus, delivering well-designed and standardized HB cardiac telerehabilitation with consistent follow-ups to recipients of HTx seems imperative. We believe that future studies should focus on well-designed HB cardiac telerehabilitation programs in recipients of HTx as this subject has area for more improvement in these patients.

Author Contributions

Alireza Hosseinpour: Conceptualization, preparation of the original draft, and final editing. Maryam Koushkie Jahromi: Reviewing, editing, and supervision.

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