Unveiling the Molecular Symphony:
Exploring miR-142-5p and miR-192-1’s Influence on Renal Transplant Rejection and Fibrosis

B. Handan Özdemir, Begüm Yavaşcaoğlu Üney, Bilkay Baştürk, Oktay Sözer, E.Tuba Canpolat, Miray Kavuzlu, Mehmet Haberal

Unveiling the Molecular Symphony:
Exploring miR-142-5p and miR-192-1's Influence on Renal Transplant Rejection and Fibrosis

Introduction

In the intricate symphony of molecular orchestration within the human body, microRNAs (miRNAs) are master conductors, deftly guiding essential biological processes like immuneresponse, inflammation, and tissue repair. Among these virtuosos, miR-142-5p and miR-192-1 emerge as stars, their melodies resonating profoundly in renal transplant pathology.

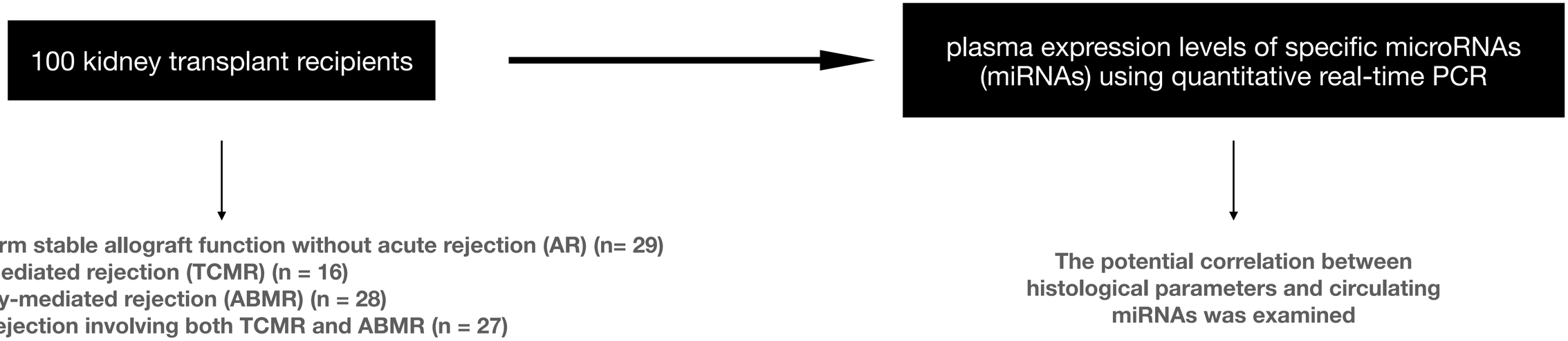
Our study endeavors to unravel the complex roles they play in the delicate dance between MIR-142-5p and miR-192-1 in the fate of renal transplants.

Financial disclosure: This study was supported by Başkent University.

Unveiling the Molecular Symphony:
Exploring miR-142-5p and miR-192-1's Influence on Renal Transplant Rejection and Fibrosis

Method

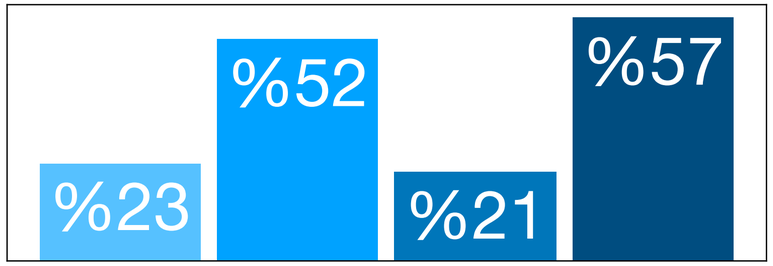
The study assessed plasma expression levels of specific microRNAs (miRNAs) using quantitative real-time PCR in a cohort of 100 kidney transplant recipients. This cohort comprised individuals with long-term stable allograft function without acute rejection (AR) (n= 29), those with T-cell-mediated rejection (TCMR) (n = 16), those with antibody-mediated rejection (ABMR) (n = 28), and those with mixed rejection involving both TCMR and ABMR (n = 27). Additionally, the potential correlation between histological parameters and circulating miRNAs was examined. ***The incidence of diffuse (>50%) interstitial fibrosis (IF) in subsequent biopsies was also evaluated as part of the follow-up protocol.***



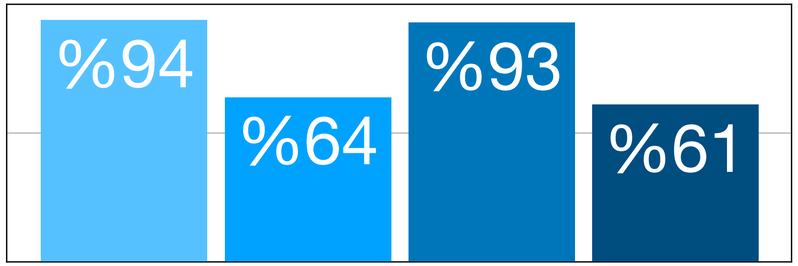
Unveiling the Molecular Symphony: Exploring miR-142-5p and miR-192-1's Influence on Renal Transplant Rejection and Fibrosis

Results

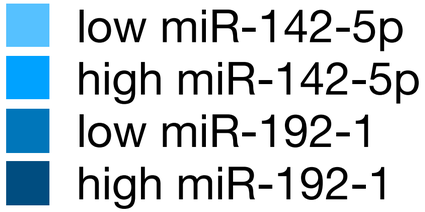
- ***Significantly upregulated expressions of miR-142-5p (p<0.001) and miR-192-1 (p<0.001) were observed in plasma samples of recipients with AR and IF development.***
- The overall 5-year risk of IF development was 23% and 52% for patients with low and high miR-142-5p, respectively (p=0.002). It was 21% and 57% for recipients with low and high miR-192-1, respectively (p<0.001).
- The overall 5-year graft survival was 94% and 64% for cases with low and high miR-142-5p, respectively (p=0.001). It is 93% and 61% for patients with low and high miR-192-1, respectively (p<0.001).



Overall 5-year risk of IF development



Overall 5-year graft survival



Upregulated miR-142-5p and miR-192-1 were significantly associated with ;
interstitial inflammation
eosinophil and plasma infiltration
peritubular capillary (PTC) C4d expression
PTC inflammation
PTC destruction
number of AR episode
vascular rejection
thrombotic microangiopathy
tubular HLA-DR expression
average time of the IF development
graft loss

Unveiling the Molecular Symphony:
Exploring miR-142-5p and miR-192-1's Influence on Renal Transplant Rejection and Fibrosis

Conclusion

Our study underscores the significant involvement of miR-142-5p and miR-192-1 in renal transplant pathology, particularly in AR and IF processes.

Additionally, the study reveals a correlation between circulating microRNAs and AR type, inflammation, and microvascularinjury.

Overall, these findings suggest that these microRNAs have the potential to serve as accessible biomarkers for monitoring AR and IF, along with microvascular injury status in AR and related pathologies.