



The Impact of Whole Blood Versus Dilute Whole Blood on Coronary Vascular Tone During *Ex Situ* Heart Perfusion

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Background

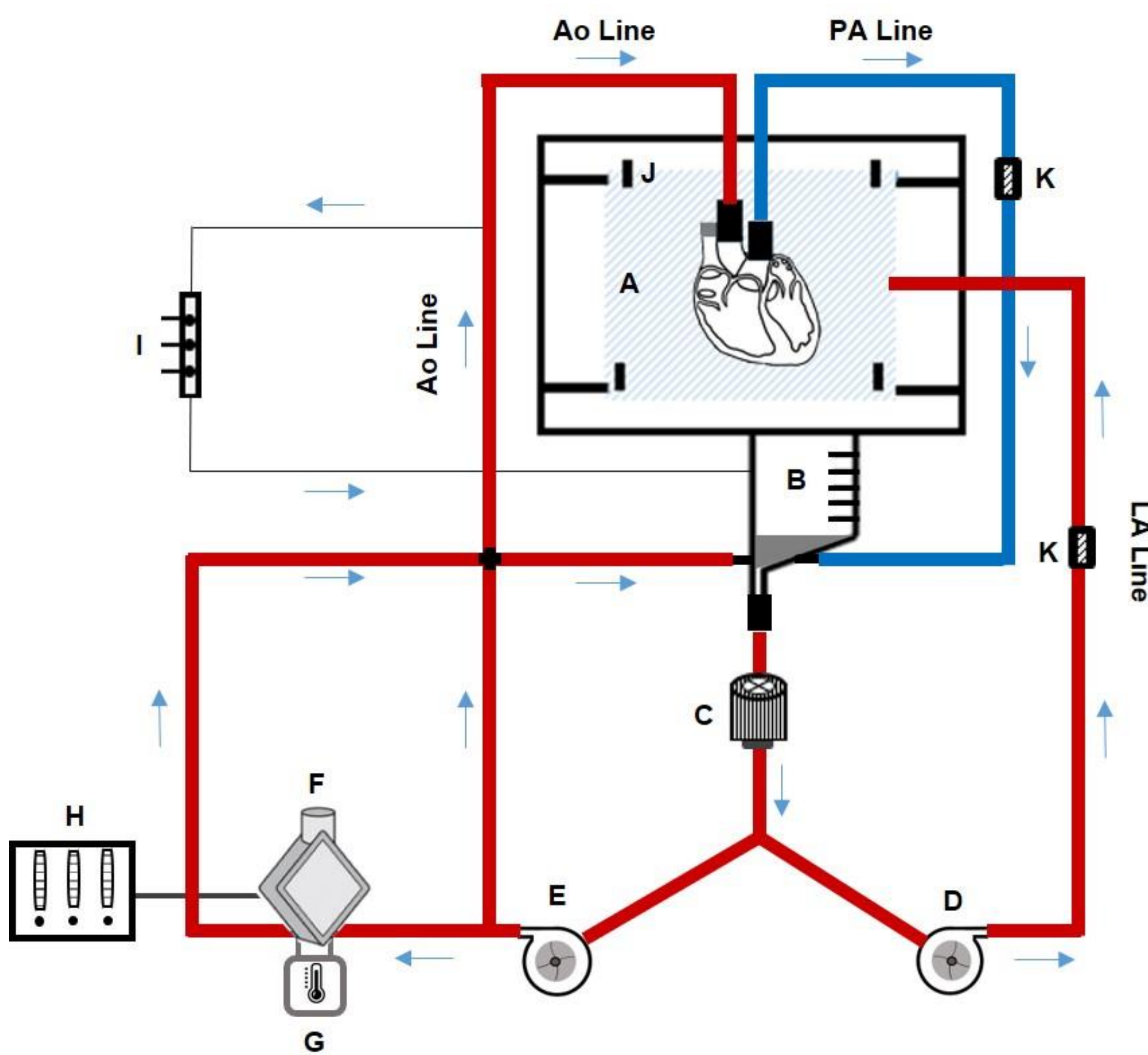
- Ex situ heart perfusion (ESHP) allows continuous functional and metabolic assessment of donor hearts before transplantation..
- Coronary vascular tone must be constantly modulated to ensure adequate myocardial perfusion.
- Evidence indicates that circulating chemical mediators in blood are involved in the regulation of oxygen supply
- We aim to evaluate whole blood versus dilute whole blood in the regulation of coronary vascular tone during ESHP

Hypothesis

Plasma contain chemical mediators that can help to main coronary vascular tone during ESHP.

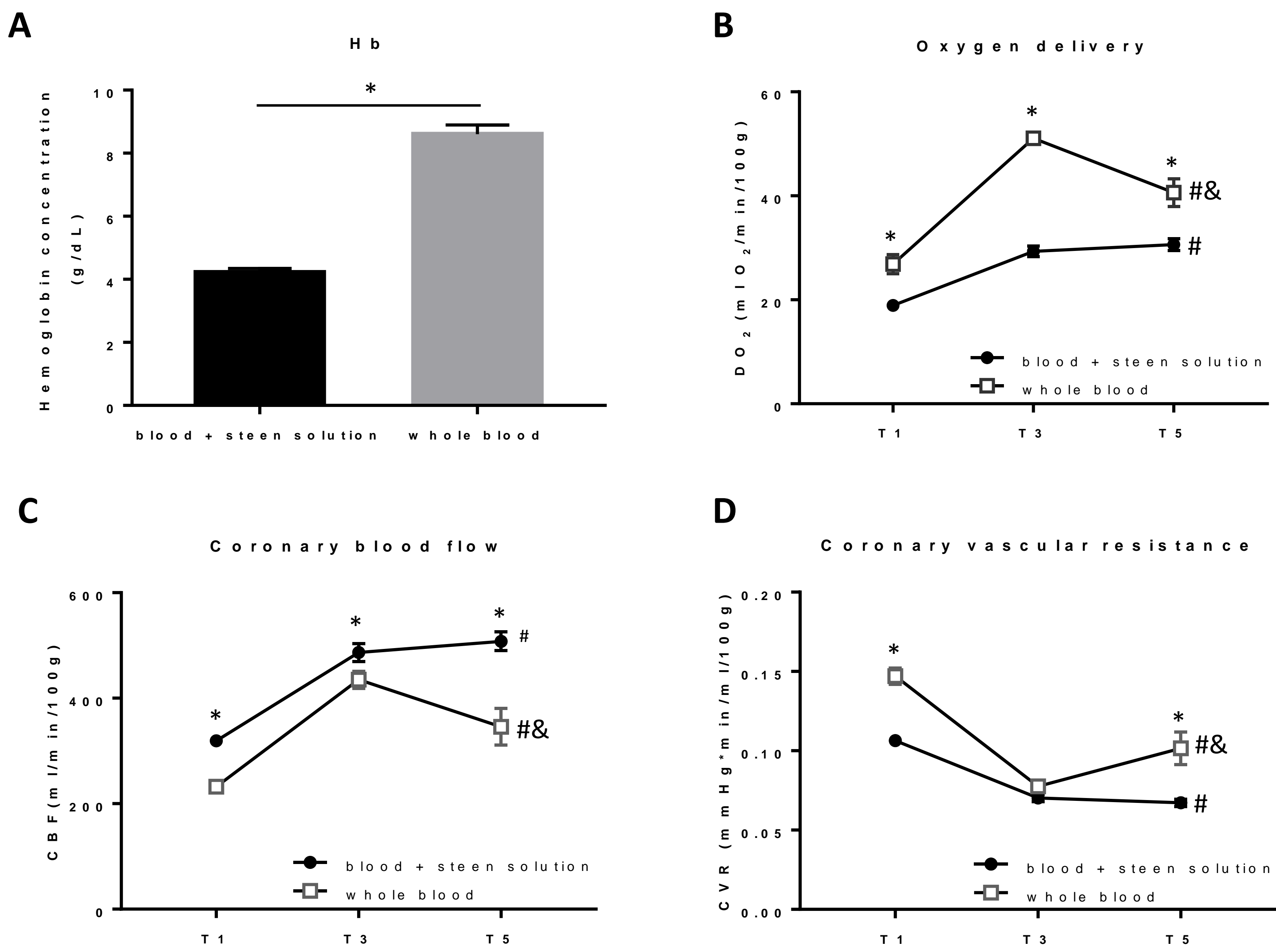
Methods

- Normal porcine hearts were perfused in working mode for 6 hours either by whole blood (n=6) or whole blood with Krebs-Henseleit solution (1:1) containing 8% albumin (n=6).
- Cardiac function parameters include cardiac index, left ventricle stroke work (LVSW), maximum left ventricle developed pressure(LVDP) increase (+dp/dt) and decrease (−dp/dt) rates were monitored in the system and compared between two groups.
- Coronary vascular resistance (CVR) was calculated to evaluate coronary artery function. These parameters were compared between groups at different time.
- The pro-inflammatory cytokines in perfusate and myocardium will be analyzed using ELISA to evaluate inflammatory response.

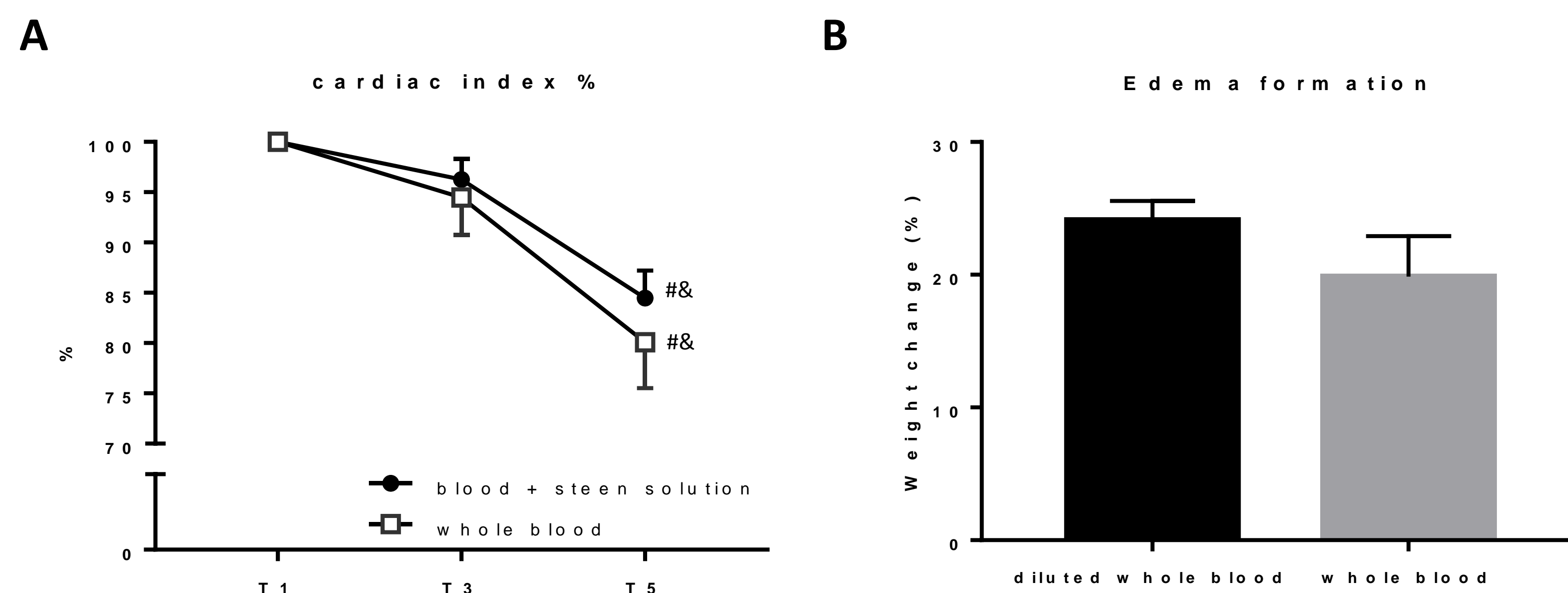


Results

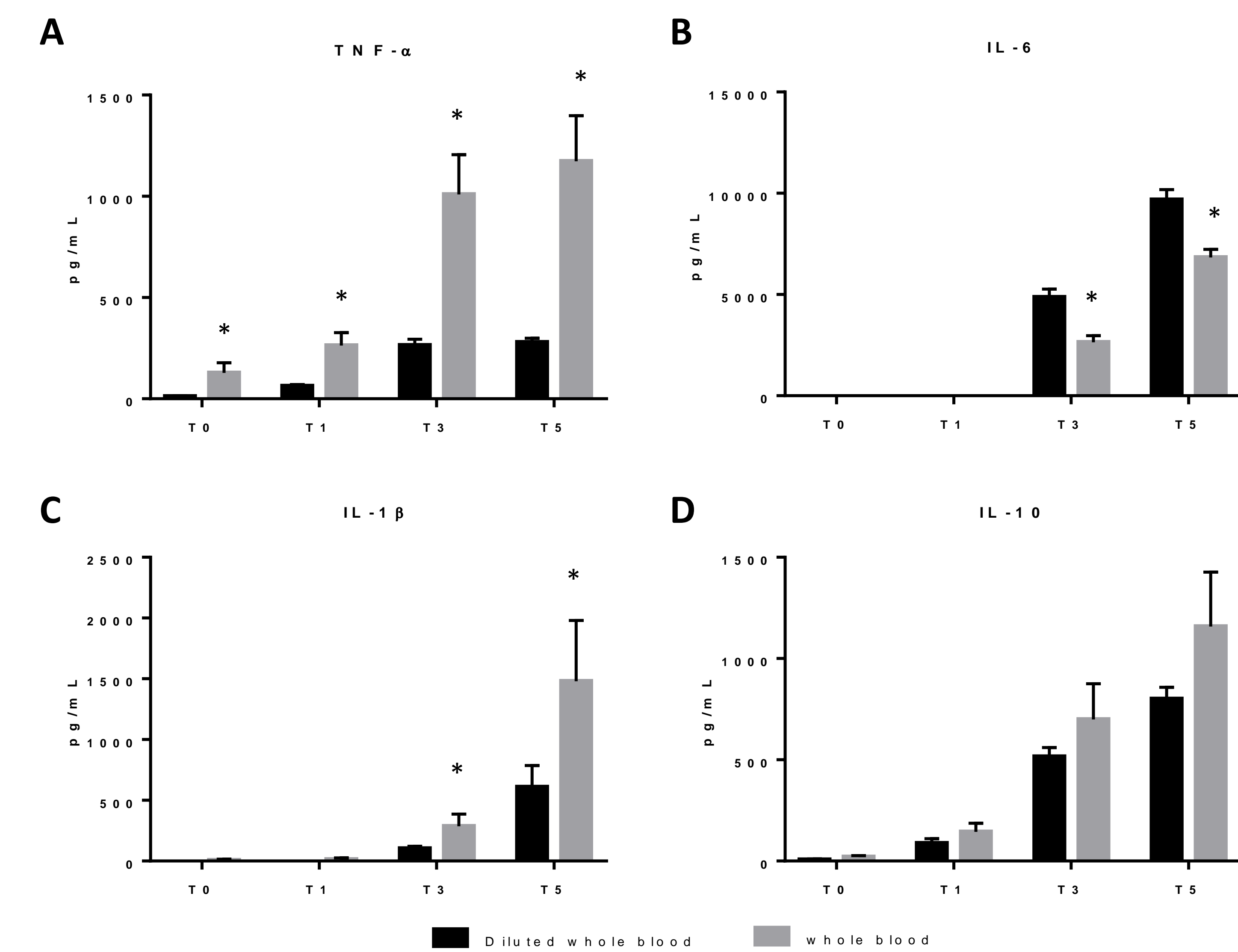
- Higher concentration of hemoglobin provide better oxygen delivery capacity in whole blood group. Coronary blood flow increased overtime in diluted whole blood group, with significantly higher than whole blood group at each time points. CVR was lost gradually in diluted whole blood group; however, it was relatively preserved in whole blood group.



2. Cardiac function declined in both groups and there was no difference in edema formation between groups.



3. Leukocytes were activated in both groups, with higher pro-inflammatory cytokines in whole blood group (except IL-6).



At different time points, compared between groups,*p<0.01, In each group, T₃, T₅ compared with T₁, #p<0.01; T₅ compared with T₃, &p<0.01

Conclusion

Whole blood appears to play a role in regulating coronary vascular tone, as indicated by relative higher vascular resistance and better oxygen delivery in whole blood perfusion after 6 hours.

Acknowledge ment

