CPD Evidence 1 (2022)

1. Registrant Information

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1.2 Profession: BMS
1.3 Registration Number: BS075665
1.4 CPD type: Self-directed – Journal-based learning
1.5 Date of completion: 18/02/2022
1.6 Standard(s) met:
Standard 2 – A registrant must identify their CPD activities are a mixture of learning activities relevant to current or future practice.
Standard 3 – A registrant must seek to ensure that their CPD has contributed to the quality of their practice and service delivery

2. Details


Ex vivo enzymatic treatment converts blood type A donor lungs into universal blood type lungs

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Wang A, Ribeiro RVP, Ali A, *et al.* Ex vivo enzymatic treatment converts blood type A donor lungs into universal blood type lungs. *Sci Transl Med.* 2022;**14(632):** eabm7190.

Organ shortage is one of the major issues remains in today's transplantation. Success transplantation is not only mediated by HLA compatibility, but also compatibility of ABO and other blood groups. For example, ABO compatibility is the determination factor for the fitness between the donor and the recipient in lieu of HLA (Reddy *et al.,* 2013). This has created a phenomenon for blood type O patient has a lower window for receiving kidney donations.

In this article, the researchers found that the combined use of two enzymes (FpGalNAc deacetylase and FpGalactosaminidase) could cleave off A and B antigens from red blood cells, converting them to O-type. They therefore injected these two enzymes into the

lungs of eight donors from type A blood by means of ex vivo lung perfusion (EVLP). The results showed that over 97% of the A antigen was cleared from the endothelial and epithelial cells of these lungs within 4 hours, and no treatment-related toxicity was observed. Three of the lungs were then subjected to a mock transplant, using O-plasma to simulate the recipient's circulation. The results showed that the experimental group minimized damage from antibody binding and complement deposition compared to the control group. These results suggest that the technique is safe and pre-clinically effective, and has the potential to improve the equity of organ allocation.

Given such an interesting method to create a “universal” blood type could significantly increase organ availability for certain types of organs, such as liver. However, this study did not encounter the possibility of passenger lymphocyte syndrome (PLS). PLS could trigger haemolysis and leads to anaemia. In this case, patients may have higher possibility suffering from PLS post-transplantation due to the fail-match lymphocytes with the “universal” type organ.

Reference:

Reddy MS, Varghese J, Venkataraman J, Rela M. Matching donor to recipient in liver transplantation: Relevance in clinical practice. *World J Hepatol*. 2013;**5(11):** 603-611.