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Progress report for project

ABO-incompatible living donor kidney transplantations in pediatric patients, a collaborative study from the Nordic Paediatric Renal Transplantation Study Group (NPRTSG)

Background

ABO-incompatible (ABOi) living donor kidney transplantation (LDKT) in adults has become a routine practice at many transplant centers worldwide. Pediatric ABOi LDKT has nonetheless remained a relatively rare event and reports on outcomes following pediatric ABOi LDKT using rituximab induction are few. Within the Nordic Paediatric Renal Transplantation Study Group Scandiatransplant a protocol for pediatric ABO-incompatible kidney transplantation was first introduced in 2005, using a protocol based on pre-operative antibody removal and rituximab, in combination with standard maintenance immunosuppression. To expand the knowledge in the field of peadiatric ABO-incompatible transplantation, a project group within the Nordic Paediatric Renal Transplantation Study Group was created and a retrospective multicenter study undertaken. Six out of eleven NPRTSG centers, in three countries, reported pediatric ABOi LDKT (recipient age <16 years): Karolinska University Hospital, Skåne University Hospital, Sahlgrenska University Hospital, Uppsala University Hospital, Oslo University Hospital, and Odense University Hospital during the study period. In total 34 pediatric ABOi LDKTs were identified and compared with 258 ABO-compatible (ABOc) pediatric LDKTs and 99 pediatric deceased donor kidney transplantations (DDKTs) performed between 2003-2018 at those six centers. For this collaborative study each participating centre appointed at least one representative.

Achievements

Approval from the Ethical Review Boards were obtained in Sweden, Denmark and Norway in 2020. A case report form (CRF) has been created and sent to the participating centers. Data has been obtained from the Scandiatransplant registry and the medical records. Felicia Kjaernet has then collected and structured the data. Online meetings with co-participants have been held regularly. Data has been analyzed and presented at several international scientific meetings. At IPTA (2022) the abstract *"Long-term outcome and complications in paediatric ABO-incompatible living donor kidney transplantation with rituximab induction: A multi-centre investigation from the Nordic Paediatric Renal Transplantation Study Group (NPRTSG)"* got The Best Abstract Award. The results have also been presented at STS Congress (2022) and TTS (2022). In addition, an ERN webinarium was recorded in 2023. Moreover, a sub-analysis of EBV viremia and rituximab induction has been performed. These results have also been presented at TTS (2022).

Current status

One manuscript, titled *"ABO-incompatibility should not be a deciding factor for living kidney donation in children: a report from the Nordic Paediatric Transplantation Study Group"* has been completed and will be submitted to American Journal of Transplantation this month. A second manuscript: *"Single-dose rituximab induction may prevent symptomatic EBV viremia in*

paediatric kidney recipients" is nearly completed and will be submitted to Pediatric Transplantation within 2024.

Further sub-studies based on the same dataset are planned and to some part already started, addressing topics within the field of pediatric kidney transplantation unrelated to ABO-incompatibility, such as surgical complications and causes of graft failure and death. An amendment to the original ethical review application was therefore filed and approved in 2024. Underway is a third and possibly fourth publication addressing these topics. The abstract *"Early surgical complications in pediatric kidney transplantation may impact first year mortality and reduce graft function: -a report from the Nordic Paediatric Transplantation Study Group"* was presented at STS Congress (2024).

Lead time

The project has progressed steadily and is nearly completed. Getting the ethical approvals in all three countries took one year. Collection and transcription of data has also required time. Doctoral student Felicia Kjaernet has done most of the data processing and analysis. She has been working full time with the project ca three months/year since the start, while also doing a residency in Surgery.

Quality

The data obtained within the project come from primarily two sources: the Scandiatransplant registries and the medical records. The use of firsthand data, i.e. the medical records, is one of the strengths of this multicenter multinational project, another is the comparatively large number of subjects. Although a prospective multicenter study on ABO-incompatible pediatric kidney transplantation would have been preferred, conducting such a study we deem challenging due to the rarity of this procedure. In comparison with the largest study on ABO-incompatible pediatric kidney transplantation thus far published which is a registry-based retrospective study complemented with a survey (Hattori et al.) we have also included recipients of deceased donor kidneys; follow-up is longer and clinical data more extensive and possibly more robust. Focus of the work within the project, which we believe is of high quality, has been on ABO-incompatible kidney transplantation but the project has also given us an opportunity to elucidate some other aspects of pediatric kidney transplantation.

Remaining work

Remaining work include finishing the manuscript with working title "Surgical complications following pediatric kidney transplantation" (spring 2025) and to compile data for an analysis of causes of graft loss and death following pediatric kidney transplantation and if data quality allows, to complete a publication (late 2025/early 2026).

On behalf of the project group, I would like to express our gratitude for the grant.

Please, do not hesitate to contact me if you have questions or comments.

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