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# On viral infections in lung transplant recipients

Akademisk avhandling

Som för avläggande av medicine doktorsexamen vid Sahlgrenska akademin, Göteborgs universitet kommer att offentligen försvaras den 19:e januari 2018, klockan 09.00 i Hjärtats Aula, Vita stråket 12, Sahlgrenska Universitetssjukhuset, Göteborg

av Jesper Magnusson leg. läkare

Fakultetsopponent:
Professor Magnus Sköld
Institutionen för medicin, Karolinska Institutet, Stockholm, Sverige

**Avhandlingen baseras på följande delarbeten**

I. Magnusson J, Westin J, Andersson LM, Brittain-Long R, Riise GC. The impact of viral respiratory tract infections on long-term morbidity and mortality following lung transplantation. Transplantation. 2013 Jan 27;95(2):383-8.

II. Magnusson J, Norder H, Riise GC, Andersson LM, Brittain-Long R., Westin J. Incidence of Hepatitis E antibodies in Swedish lung transplant recipients. Transplant Proc. 2015 Jul-Aug;47(6):1972-6.

III. Magnusson J, Westin J, Andersson LM, Lindh M, Brittain-Long R, Nordén R, Riise GC. Early Viral respiratory tract Infection is a risk factor for chronic rejection after lung transplantation. Submitted

IV. Nordén R, Magnusson J, Lundin A, Tang K, Nilsson S, Lindh M, Andersson LM, Riise CG, Westin J. Quantification of Torque teno virus and Epstein-Barr virus has limited potential as biomarkers for monitoring of immunosuppression after lung transplantation. Submitted.

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# On viral infections in lung transplant recipients

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## ABSTRACT

Viral infections are the most common type of infection in humans. Lung transplantation (LTx) recipients are exceptionally susceptible to infections in general, and the short- and long- term effects tend to be more detrimental. It is important to better determine the effects and outcomes of viral infections to improve survival and long-term quality of life after LTx. The following hypotheses were tested: that early viral respiratory tract infection (VRTI) has long term effect on outcome after lung transplantation (Papers I and III); that hepatitis E (HEV) antibodies are common in Swedish lung transplant recipients (Paper II); and that torque teno virus (TTV) and Epstein-Barr virus (EBV) may be potential biomarkers for monitoring of the net state of immunosuppression after LTx.

*Methods:* Bronchiolar lavage (BAL) samples from a retrospective cohort (Paper I) and from a prospective cohort, together with nasopharyngeal (NPH) samples (Paper III) were analyzed with a multiplex PCR for respiratory viruses. Prospectively collected blood samples were analyzed for HEV antibodies using two ELISA methods (Paper II) and for TTV and EBV using PCR (paper IV).

*Results:* VRTI during the first year was associated with a shortened time to chronic rejection but not to death in both the retrospective cohort and the prospective cohort (Paper I and III). Thirteen per cent of the patients had anti-HEV antibodies during follow-up. No association between TTV DNA nor EBV DNA and immunosuppression-related events could be found.

*Conclusions:* VRTI during the first year is an independent risk factor for chronic rejection. HEV antibodies are equally common in the LTx population and the general Swedish population. EBV DNA and TTV DNA have limited usefulness as biomarkers for monitoring of immunosuppression after lung transplantation.

**Keywords**: Lung transplantation, Respiratory infection, Respiratory virus, Hepatitis E, Torque teno virus, Epstein Barr virus, Chronic lung allograft dysfunction.

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