Speaker Abstracts

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Case study – schistosomiasis

Background: Schistosomiasis, a WHO-appointed neglected tropical disease, is caused by multicellular parasites transmitted by fresh water snails. Its treatment relies on the use of one drug only, praziquantel, which is insufficient to control transmission in highly endemic areas. Novel medicines and vaccines are urgently needed to expand the toolbox for schistomiasis control. An experimental human model for schistosomiasis could accelerate the development of these products.

Materials & Methods: We performed a dose-escalating clinical safety trial in 17 volunteers who were dermally exposed to male Schistosoma mansoni (Sm) cercariae, which do not produce eggs at the Leiden University Medical Center, the Netherlands. The safety as well as the infectivity and kinetics of worm-derived circulating anodic antigen (CAA), the primary biomarker readout for infection, was studied.

Results: We found a dose-related increase in adverse events related to acute schistosomiasis syndrome. This syndrome had previously been attributed to egg formation. Overall there seemed to be a dose-response relationship between adverse events and challenge dose. Symptoms could not be predicted from baseline characteristics. Serum CAA peaked above detection levels in the majority of volunteers several weeks after exposure. All volunteers showed IgM and IgG1 seroconversion and worm-specific cytokine production by CD4+ T-cells. All volunteers were cured with praziquantel provided at 12 weeks after exposure.

Conclusions: Infection with 20 Sm cercariae leads to severe adverse events in a minority of volunteers and provides high infection rates, paving the way for fast-track product development for treatment and prevention of schistosomiasis.