PARAINFLUENZA VACCINE STATUS

Prepared by: Christopher Hurtado

CURRENT VACCINES IN DEVELOPMENT

- As of December 2017, there were 4 HPIV vaccine candidates in clinical trials.
  - rHPIV3cp45, a live attenuated intranasal vaccine developed by NIAID, has completed a phase 1 trial. The target for this vaccine is children 6-36 months old.[1]
  - rB/HPIV3, a live attenuated chimeric bovine/human vaccine developed by NIAID, has completed a phase 1 trial. The targets for this vaccine are adults over 18 years of age and children 6-59 months old.[1]
  - MEDI-534, a live attenuated intranasal RSV + HPIV3 vaccine developed by MedImmune LLC has completed a phase 1 and a phase 1/2a trial. The targets for this vaccine are children aged 2 months to 9 years.[1]
  - HMPV/PIV3 mRNA Vaccine (mRNA-1653), developed by Moderna, started phase 1 clinical trials in December 2014. The target for this vaccine is children.[2]

CHALLENGES

- A multivalent HPIV vaccine is needed to provide adequate protection from the various HPIV serotypes.[3]
- Research into potential subunit vaccine options have been severely limited since the 1960s due to the "disastrous results of the formalin-inactivated RSV vaccine trials," which showed enhanced viral activity after natural infection.[2]
  - The most recent subunit vaccine study showed induction of protective immunity in hamsters.[4]

PREVIOUS CLINICAL TRIALS

Anderson et al provide a valuable summary of previous trials. In short, they describe that very few PIV3 live attenuated vaccines have entered phase 1 clinical trials. No adverse events have been documented. One vaccine candidate showed promising seroresponses in infants ages 6-12 months.[1]

REFERENCES

1. Anderson AJ, Snelling TL, Moore HC, Blyth CC. Advances in vaccines to prevent viral respiratory illnesses in children. *Paediatr Drugs* 2017;19(6):523-531.
2. Moderna. Pipeline. https://www.modernatx.com/pipeline. Accessed May 3, 2018.
3. Branche AR, Falsey AR. Parainfluenza virus infection. *Semin Respir Crit Care Med* 2016;37(4):538-554
4. Garg R, Brownlie R, Latimer L, Gerdts V, Potter A, van Drunen Littel-van den Hurk S. Vaccination with a human parainfluenza virus type 3 chimeric FHN glycoprotein formulated with a combination adjuvant induces protective immunity. *Vaccine* 2017;35(51):7139-7146.

Date: May 3, 2018