Intranasal and intrapulmonary vaccination with an M protein-deficient respiratory syncytial virus (RSV) vaccine provides protection to infant baboons against an RSV infection.

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Results (con’t)

None of the authors have conflicts to declare

Intrapulmonary (IP) routes of vaccination in an infant baboon model

We studied the effectiveness of Mnull RSV given by intranasal (IN) and intrapulmonary (IP) routes of vaccination in an infant baboon model.

Intrapulmonary vaccination with an M protein-deficient respiratory syncytial virus (RSV) vaccine provides protection to infant baboons against an RSV infection.

Mnull RSV should therefore avoid problems of immunogenicity and reactogenicity associated with earlier vaccines.

Live, replicating vaccines may cause unacceptable respiratory illness.

In the absence of M, RSV infects a cell, expresses all its proteins (except M) and induces immune responses. However, it cannot reassemble and replicate further.

Mnull RSV should therefore avoid problems of immunogenicity and reactogenicity associated with earlier vaccines.

We studied the effectiveness of Mnull RSV given by intranasal (IN) and intrapulmonary (IP) routes of vaccination in an infant baboon model.

Infant (2 week) baboons were vaccinated as follows:

- IN: Mnull RSV (4 x 10^7 units) was introduced by nasal spray at age 2 weeks, and a booster dose was repeated in 4 weeks.
- IP: Mnull RSV (8 x 10^7 units) was introduced once through an endotracheal tube in sedated, intubated animals at age 2 weeks. No booster dose was administered.

- A sham vaccine was administered (IN or IP) to similar animals in the same fashion as described for Mnull RSV vaccinees.

All animals were challenged with 8 x 10^7 pfu of live RSV delivered intratracheally 4 weeks after IN vaccination and 4-6 months after IP vaccination.

- Animals were followed continuously daily for viral replication rates both before and after RSV challenge.
- On days 0, 5, 7 and 12-14 after challenge, serum and BAL fluid were obtained for RSV neutralizing antibody (RSV NA), and BAL fluid was cultured for RSV. In addition, work of breathing was assessed using software intrinsic to the ventilator.

CONCLUSIONS

- IN vaccination with Mnull RSV induced inconsistent antibody responses, but still moderately reduced tachypnea and viral replication following RSV challenge.

- A single IP vaccination at 2 weeks of age induced RSV NA responses persisting at least 6 months, and reduced tachypnea, viral replication, and WOB 4-6 months following RSV challenge, suggesting a novel method of preventing RSV infection.

- We are investigating Mnull RSV immunization of the lung using nebulizer delivery.

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