Vaccines in Older Persons

Dr Rod Pearce AM
Immunisation Coalition
(Australia)

APACI March 2018

School of Public Health, KIIT Deemed to be University, Bhubaneswar, Odisha, India


2
ANNA BINNA
NEW HOLLAND

The global **annual** attack rate of **influenza** is estimated at 5%–10% in adults and 20%–30% in children. Worldwide these epidemics are estimated to result in about 3-4 million cases of severe illness and about **250,000 to 500,000 deaths**

In a non pandemic year
about 90%
of seasonal flu **deaths** are in seniors.

Recent studies have shown failure of vaccination programs in elderly elderly

While vaccine effectiveness can vary

it is generally accepted,

-Vaccination reduces the risk of flu illness by between 40% and 60% among the overall population (matched vaccine)

-tends to work better against influenza B and influenza A(H1N1) viruses and

-offers lower protection against influenza A(H3N2) viruses

Above the age of 75 years, pooled estimates were **unable** to demonstrate any significant effectiveness (of vaccination) across all seasons against influenza

Reasons for vaccine failure

- poor match
- weak vaccine
- immune senescence (elderly people showed less antibody response and antibodies for a shorter time)

-Season changes with normal drift

-No distinct influenza season

POOR MATCH

In the making of vaccine they are usually cultured in egg

Growth in eggs is part of the production process for most seasonal flu vaccines. While all influenza viruses undergo changes when they are grown in eggs, **changes in influenza A(H3N2)** viruses tend to be more likely to result in antigenic changes compared with changes in other influenza viruses. These so-called "egg-adapted changes" are present in vaccine viruses recommended for use in vaccine production and may reduce their potential effectiveness against circulating influenza viruses

WEAK VACCINE

-Peak immune response about 11 year old

-Need stronger antigen response in elderly

IMMUNE SENESCENCE

The 2009 global pandemic mortality estimate similar in magnitude to that of seasonal influenza, BUT a marked shift toward mortality among persons <65 yo

The burden varied greatly among countries, (greater severity in the Americas than in Australia, New Zealand, and Europe.)

PANDEMIC PARADOX

-Increase the dose of the antigen

-Make the vaccine cause more immune response

-Live vaccine

-Decrease circulating viral load

-Vaccinate just before the outbreak

-Add extra strains to the vaccine

>……SOLUTIONS……..<

-Increase the dose of the antigen

-Make the vaccine cause more immune response

-Live vaccine

-Decrease circulating viral load

-Vaccinate just before the outbreak

-Add extra strains to the vaccine

>……SOLUTIONS……..<

-Increase the dose of the antigen

-Make the vaccine cause more immune response

-Live vaccine

-Decrease circulating viral load

-Vaccinate just before the outbreak

-Add extra strains to the vaccine

>……SOLUTIONS……..<

-Increase the dose of the antigen

-Make the vaccine cause more immune response

-Live vaccine

-Decrease circulating viral load

-Vaccinate just before the outbreak

-Add extra strains to the vaccine

>……SOLUTIONS……..<

-Increase the dose of the antigen

-Make the vaccine cause more immune response

-Live vaccine

-Decrease circulating viral load

-Vaccinate just before the outbreak

-Add extra strains to the vaccine

>……SOLUTIONS……..<

-Increase the dose of the antigen

-Make the vaccine cause more immune response

-Live vaccine

-Decrease circulating viral load

-Vaccinate just before the outbreak

-Add extra strains to the vaccine

>……SOLUTIONS……..<

relative Vaccine Effectiveness (rVE) of IIV3-HD vs. IIV3,

against influenza-like illness,
rVE 18.3%, (95% CI: 7.0 to 28.3%
against hospital admissions,
rVE 19.4%, (95% CI: 6.7 to 30.4%
against pneumonia
rVE 22.4%, (95% CI: 5.0 to 36.5%
cardiorespiratory events
rVE 12.0%, 95% CI: 4.9 to 18.6%
death following a hospital admission for influenza
rVE 22.2%, 95% CI: -18.2 to 48.8%).

INCREASE THE DOSE OF THE ANTIGEN

relative Vaccine Effectiveness (rVE) of IIV3-HD vs. IIV3,

against influenza-like illness,
rVE 18.3%, (95% CI: 7.0 to 28.3%

against hospital admissions,
rVE 19.4%, (95% CI: 6.7 to 30.4%
against pneumonia
rVE 22.4%, (95% CI: 5.0 to 36.5%
cardiorespiratory events
rVE 12.0%, 95% CI: 4.9 to 18.6%
death following a hospital admission for influenza
rVE 22.2%, 95% CI: -18.2 to 48.8%).

INCREASE THE DOSE OF THE ANTIGEN 18%

relative Vaccine Effectiveness (rVE) of IIV3-HD vs. IIV3,

against influenza-like illness,
rVE 18.3%, (95% CI: 7.0 to 28.3%

against hospital admissions,
rVE 19.4%, (95% CI: 6.7 to 30.4%

against pneumonia
rVE 22.4%, (95% CI: 5.0 to 36.5%
cardiorespiratory events
rVE 12.0%, 95% CI: 4.9 to 18.6%
death following a hospital admission for influenza
rVE 22.2%, 95% CI: -18.2 to 48.8%).

INCREASE THE DOSE OF THE ANTIGEN

18% 19.4%

relative Vaccine Effectiveness (rVE) of IIV3-HD vs. IIV3,

against influenza-like illness,
rVE 18.3%, (95% CI: 7.0 to 28.3%
against hospital admissions,
rVE 19.4%, (95% CI: 6.7 to 30.4%

against pneumonia
rVE 22.4%, (95% CI: 5.0 to 36.5%
cardiorespiratory events
rVE 12.0%, 95% CI: 4.9 to 18.6%
death following a hospital admission for influenza
rVE 22.2%, 95% CI: -18.2 to 48.8%).

INCREASE THE DOSE OF THE ANTIGEN

18% 19.4% 22.4%

relative Vaccine Effectiveness (rVE) of IIV3-HD vs. IIV3,

against influenza-like illness,
rVE 18.3%, (95% CI: 7.0 to 28.3%
against hospital admissions,
rVE 19.4%, (95% CI: 6.7 to 30.4%
against pneumonia
rVE 22.4%, (95% CI: 5.0 to 36.5%

cardiorespiratory events

rVE 12.0%, 95% CI: 4.9 to 18.6%

Death after hospitalisation for 'flu
rVE 22.2%, 95% CI: -18.2 to 48.8%).

INCREASE THE DOSE OF THE ANTIGEN

18% 19.4% 22.4% 12.O%

relative Vaccine Effectiveness (rVE) of IIV3-HD vs. IIV3,

against influenza-like illness,
rVE 18.3%, (95% CI: 7.0 to 28.3%
against hospital admissions,
rVE 19.4%, (95% CI: 6.7 to 30.4%
against pneumonia
rVE 22.4%, (95% CI: 5.0 to 36.5%
cardiorespiratory events
rVE 12.0%, 95% CI: 4.9 to 18.6%

Death after hospitalisation for 'flu

rVE 2.2%, 95% CI: -18.2 to 48.8%).

INCREASE THE DOSE OF THE ANTIGEN

18% 19.4% 22.4% 12.O% 2.2%

The biggest issue with the use of adjuvants for human vaccines, particularly routine childhood vaccines, is **the toxicity and adverse side-effects** of most of the adjuvant formulations

Although MF59-adjuvanted vaccine is transiently more reactogenic than nonadjuvanted vaccine, there is **no evidence that it increases risks** for serious adverse events, including those with an autoimmune disorder

ADJUVANT

Trivalent adjuvanted vaccine is a more appropriate choice than standard quadrivalent vaccine for older people.

ADJUVANT

The priority for adjuvanted vaccine should be for those aged 75 years and above as this age group appear to derive little benefit from the standard vaccine.

ADJUVANT

Given the low influenza vaccine effectiveness seen in the over 65 year olds in seasons dominated by A(H3N2), the **use of aTIV** in those aged 65 years and over would be both more effective and cost-effective than the non-adjuvanted vaccines currently in use

ADJUVANT

We have vaccines now that we know will work in the elderly but influenza still provides many other interesting challenges

THANKYOU