Immunity to mumps, measles and rubella in forced migrants: Can immunity to one be used as a marker to immunity in the others?

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Background – the diseases MMR

- Mumps, aka epidemic parotitis
- Measles, aka morbilli, English measles
- Rubella, aka German measles

- All previously very common, 12.5 million rubella cases in USA 1963/64
- All viral diseases
- All spread through the air, eg couging
- All controlled by one vaccine - MMR

The diseases

- Mumps, usually mild, often temporarily affects other organs, eg brain, but can cause permanent effects eg deafness in one ear. Death rate = 1 in 10,000 reported cases
- Measles; most infectious disease known. Serious disease especially in malnourished children. Can affect many organs. Death rate = 3 in 1000 reported cases in developed countries

- Rubella; usually mild rash and fever in adults, BUT in the first 8 weeks of pregnancy, 85% of unborn children badly affected. Woman usually 2 weeks pregnant before she misses first period.

Background – immunity

Exposed to disease but will not catch it

A) Active immunity – actions of body, long term, by 1) catching the disease 2) vaccination

B) Passive – from another person, short term 1) mother – child 2) injection of blood extract from people recovered from MMR

As part of the immune process, body produces substances called antibodies

- For each disease, the body produces a unique antibody
- Transmitted in passive immunity
- Level of each antibody can be measured in a person's blood
- If the antibody is above a certain level, the person is immune to that disease, ie won't catch that disease*, and vice versa

* *Terms and conditions apply*

Background – MMR vaccine

- Very effective, 95% with one dose
- Live viral vaccine, contains 3 *attenuated** MMR viruses
- Some restrictions on its use, in particular cannot be given to women who are, or may become pregnant

**Attenuated means weakened, by growing outside body in laboratory. Produces immunity without disease, not infectious*

Background – vaccination and immunity

- In general, if there is doubt, not worth testing for immunity, just vaccinate
- Some exceptions eg 1) Vets working in countries with rabies, 2) Women who are, or wish to become pregnant , 3) close contacts of hepatitis B carriers, 4) close contacts of hepatitis A cases

- No harm in vaccinating an immune person, nothing happens
- Any refugee or asylum seeker without *documented* vaccination is restarted on funded vaccination programme for their age

Background – women and rubella

- All women who are or wish to become pregnant should know their rubella status
- Virtually all refugee women don't know this
- Most refugee women do not have *documented* vaccination records
- MMR can only be given to sexually active women if they are using effective contraception

- Effective means hormonal, = OC, depo injection or implant; IUD; tubal ligation or vasectomy. Does not include condoms, rhythm, withdrawal or breastfeeding*(*T&CA)*
- Many refugee women do not know about or do not wish to use effective contraception. Also, often not enough time to ensure effective contraception during their stay at the Refugee Centre
- So, it is best to test sexually active women without contraception for rubella while at Mangere, so they know.

The question

If you test for immunity to one of the MMR diseases, and the person is immune to that one, can you assume they will be immune to the other two?

The answer

No, you would be wrong. Our study shows how wrong you would be.

The Study

Summary of total database

- Total = 117
- Age: range = 4yrs – 83yrs, average = 32.13 yrs, SD = 12.06yrs
- Sex ratio % F:M = 70:30
- Ethnicity/nationalities = 29, major ethnicities = Afghani 9%, Burmese 12% , Iraqi 9% Sri Lankan 19%
- Refugee status seekers:Quota refugees, % = 51:49

Summary of females 12years and older only database

- Total = 79
- Age: range 12yrs – 67yrs, average = 32.40, SD = 9.16 years
- Ethnicity/nationality = 22, major ethnicities = Afghani 12%, Burmese 16%, Colombian 9%, Iraqi 9%, Sri Lankan 13%
- Refugee status seekers: quota refugees, % = 28:72

Immunity rates, females 12yrs and older only

- Immune to all three diseases % = 68.35
- Immune to mumps % = 91.13
- Immune to measles % = 88.61
- Immune to rubella % = 83.54

(last three includes those immune to all three. Immune to any two not noted here)

Predictions

So, if a female 12 years and older is immune to morbilli, and:-

- If you assume she will be immune to mumps, you will be wrong 11% of the time
- If you assume she will be immune to rubella, you will be wrong 22% of the time
- Even if she is immune to measles and mumps, she will not be immune to rubella 10% of the time

Acknowledgements and thanks

- A detailed statistical analysis with confidence intervals etc prepared by Simon Thornley is available
- Thanks to other staff members, and to the refugees and asylum seekers

Satakieli (Nightingale) unaccompanied refugee childrens' residence, Tampere, Finland