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MMR Vaccine at 12 Months of Age: Is It Safe and Effective?

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This study offers some reassurance about immunizing children with MMR at 12 months of age, and it also demonstrates some key take-home points for translating this type of information into clinical practice.

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Source: Kontio M, Palmu AA, Syrjänen RK, et al. Similar antibody levels in 3-year-old children vaccinated against measles, mumps, and rubella at the age of 12 months or 18 months. J Infect Dis. 2016;213(12): 2005-2013; doi:10.1093/infdis/jiw058.

This observational study looked at antibody concentrations to measles, mumps, and rubella in 187 3 year-old Finnish children following MMR vaccine administered sometime between 11 and 20 months of age. The concern about giving MMR too early is primarily that maternal antibody might interfere with the infant's own antibody response, plus a problem in younger childrens' (especially under 6 months of age) immune systems not recognizing these viral antigens well enough to form antibody. The investigators found essentially equivalent results regardless of age of vaccination, although the subgroup of boys vaccinated at 11-13 months had lower antibody concentrations compared to girls in this subgroup. Overall this is reassuring information that vaccination at 12 months is a good idea, especially since larger studies have shown an increased (though still relatively rare) risk of seizures in children immunized with measles-containing vaccines at 16-23 months of age.

Four take-home points occurred to me for clinicians to consider when applying these results to their own practice.

1. Antibody concentrations are fine and dandy, but we don't really care about that, right? What we care about is whether a child with a particular antibody concentration, when exposed to the natural disease, will get sick or not. So, how reliable are these antibody concentrations in predicting real protection from disease? In the case of MMR, it's pretty good, particularly in this study with respect to measles vaccine where they actually utilized 3 different assays to characterize measles protection. By comparison, some other antibody tests, such as hepatitis B or varicella, are less accurate in predicting disease protection, though usually erring in underestimating degree of protection.

2. Is this the same vaccine we use in the United States? Well, not exactly, but the authors tell us which viral strains are in their vaccine, and they are the standard strains and amounts pretty much everyone uses, so I wouldn't worry about this issue.

3. Similar to above, is there anything else about this study being performed in Finland that wouldn't quite apply in the US? The authors don't state specifically, but in general Scandinavian populations tend to be more homogeneous than in the US. There are some ethnic differences in antibody response to various pathogens, so I would be a bit cautious about directly extrapolating Finnish data, likely largely from Caucasians, to a clinical practice serving primarily African-Americans, for example. Minor differences might exist, but until someone does that study it's hard to say whether these differences are important; I suspect they are not.

4. The authors "powered" their study to detect a 35% difference in antibody titers between the groups immunized at 12 versus 18 months and came up with a sample size of 70 in each group. However, it wasn't powered to detect a significant difference in subgroups based on gender. Still, they did detect a significant difference in this subgroup. The main problem with an underpowered study is missing a difference when there really is one (type 2 error), which didn't occur here with the difference seen in young boys. Just be aware that other differences might be present if a larger group had been studied.

Even with these limitations, this study is a nice refinement of our understanding of MMR vaccination in the modern era, when most maternal antibody to MMR is from their own childhood immunizations, rather than from natural disease which produces higher, and longer-lasting, antibody concentrations that were more likely to block infant response to immunization.

Further Reading

- Antibody Response to MMR Given at 12 Months and 18 Months
- MMR among vaccines that may be needed for patients with travel plans
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