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15-minute consultation: Should I get my child the varicella (chickenpox) vaccine?

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Abstract

The Joint Committee on Vaccination and Immunisation (JCVO) has recently recommended the introduction of the varicella (chickenpox) vaccine into the UK's routine childhood immunisation schedule. This was previously only available to a small group of eligible children or through private healthcare providers. Engaging families in conversations around vaccines is recognised as important for informed decision making, and professionals leading these discussions need to be confident and well-informed. This article aims to provide an overview of the evidence behind the decision to introduce varicella (chickenpox) vaccine, and addresses anticipated questions.

Introduction

Child healthcare professionals in the UK face a dilemma: declining vaccine uptake alongside the introduction of new vaccines into the childhood schedule is increasing pressure on the paediatric healthcare service(1). Considered discussions with families remain paramount to ensure protection of the paediatric population; healthcare professionals are ranked highly as trusted sources of advice for vaccination and thus are influential in parental decision making(2).

The recommendation by the Joint Committee of Vaccination and Immunisation (JCVI) to add the varicella (chickenpox) vaccine to the UK routine schedule(3)is based on newly available data (3). A previous article has discussed the pros and cons of the varicella (chickenpox) vaccine when getting this vaccine was optional and available only through private healthcare providers(4), however this article centres around the upcoming introduction to the routine schedule and how this changes the discussion. Surveys of healthcare professionals (HCPs) and parents suggest an appetite for the chickenpox vaccine is present, though not without some concerns and questions(2,5,6); these should be addressed to support informed decision making and maximise vaccine uptake.

The quadrivalent measles/mumps/rubella/varicella vaccine (MMRV) has been recommended by the JCVI, aligning with parental preference for a combination vaccination over an additional injection at the same visit (2)and HCPs preference for delivery format(2,6). Combination vaccines are a common source of vaccine hesitancy with parents citing concerns about the number of antigens being presented at one time. This was not borne out by study data, however this may be due to acknowledged limitations in the lack of representation of vaccine hesitant populations in the surveys. The current increase in measles cases in England, over six times as many cases in 2024 (as of

August) compared to the whole of 2023 (7)highlights the importance of mitigating any impact on MMR uptake (7). Given vaccine overload can be a common concern of vaccine hesitant families, discussions should cover any hesitation at the inclusion of an additional live antigen to the MMR delivery.

This article provides healthcare professionals with the knowledge base to discuss the varicella (chickenpox) vaccine and signposts resources on vaccine conversations, alongside appropriate resources to signpost the families.

Is the varicella (chickenpox) vaccine safe?

The varicella (chickenpox) vaccine has been in routine use in many countries for approximately 30 years, so there is a large volume of data around its safety, immunogenicity and efficacy. Headline facts are in Box 1.

Box 1: Varicella (chickenpox) Vaccination Headline Facts – what you need to know (3,8,9)

- Mild reactions such as fever, local swelling/redness and rash are common, similar to other childhood vaccines such as the MMR and Men B
- The combined vaccine (MMRV) carries a small increased risk of benign febrile seizure after the first dose only
- A two-dose schedule prevents 93% of disease of any severity; one dose prevents 99% of severe disease
- Implementation is planned for a 2-dose schedule at 12 and 18 months, with a catch-up campaign for older children (ages to be decided)

Vaccine safety is a primary concern of parents; fortunately, the varicella (chickenpox) vaccine is well-established with data on routine use demonstrating no safety concerns, aside from expected mild reactions in Box 1(9). Forewarning parents of side effects of a vaccine, and how to manage them, may reduce anxiety and maintain parental trust; in the case of the MMRV, delayed side effects at 7-10 days post vaccination should be explained (fever, injection site reaction(9)) and written information on management provided in advance.

A rash post-vaccination, typically within one month, resembling a chickenpox rash is reported in around 3-5% vaccines(9). Contact avoidance of those who develop the rash with immunosuppressed groups is recommended as they could theoretically contract the attenuated virus strain; Box 2 explains how this applies to pregnant people. This occurs infrequently and reported cases have been mild(9).

Box 2: Varicella (chickenpox) Vaccine in relation to Pregnancy(10,11)

- UK guidelines suggest checking varicella serology in pregnant people with a negative chickenpox history; this would impact their management if exposed to varicella during pregnancy
- The VARIVAX Pregnancy registry of all accidental vaccination using the varicella (chickenpox) vaccine in pregnancy reports no episodes of congenital varicella syndrome, or any increased prevalence of birth anomaly; but as a live vaccine it remains not recommended in pregnancy
- A seronegative pregnant person could theoretically contract the vaccine virus strain from someone who had developed the post vaccination rash. However this would only be directly from the rash, rather than by droplet as well as would be the case in a wild type varicella infection
- A pregnant person is not a contraindication for vaccination of household contacts; the benefit of reducing exposure to disease by vaccination contacts outweighs the theoretical risk of transmitting the vaccine-type strain
- Similarly in line with UK guidelines, the siblings of immunosuppressed children (e.g. receiving chemotherapy) should receive the vaccine as there is a higher risk from disease exposure than post vaccination rash exposure.

Some post-licensure studies have found an estimated two-fold increased risk of febrile convulsions after the first dose of MMRV compared with separate simultaneous vaccines. The actual risk remains small with an estimated one additional febrile convulsion for every 2500 children who receive the combined vaccine(12) against a baseline of an expected 10 per 2500 children receiving separate vaccines(12). The decision to introduce the combination vaccine takes into account this increased risk, weighing it against the need for an additional injection at the same visit, the relatively benign nature of febrile convulsions and minimal impact on healthcare systems, as well as the low incidence of convulsions in comparison to that expected in the general paediatric population. Explaining this complex balance to parents may be challenging, and some aids for this are below in Figure 1 and Box 3(12)Figure 1 shows that just over 2 in 100 children on average (so 50 in a cohort of 2500), and will have a febrile seizure by 5 years in the general population, in comparison, 1 in 2500 will have one following separate vaccines and 2 in 2500 after the combined MMRV.

Box 3: Examples of describing the rates of febrile seizures(13)

- In 41 average size school classes (30 children), 1 child would have a febrile convulsion after the MMRV; in comparison on average 287 children in this group would be expected to have a febrile convulsion at some point before turning 5.
- If a stadium with 90,000 capacity was packed full of children who had the MMRV rather than separate vaccines, there would be 36 additional febrile convulsions, but 90,000 less needles!

Does the vaccine work and how long does protection last?

A summary of 25 years of post-licensure data from the USA reported long lasting protection: 100% protection from severe disease with one dose, and 82-85% protection against any disease(14). A two-dose schedule improved efficacy against any disease by 10%, evidenced by a decreased varicella

incidence and fewer outbreaks(14). Whilst we have evidence suggesting lasting protection for the time the vaccine has been in use, we do not have data demonstrating its immunogenicity past this.

Why is the vaccine being introduced now, instead of earlier?

Key points for why the varicella (chickenpox) vaccine are being introduced now are summarised in Box 4.

Box 4: Changes in evidence leading to new introduction of varicella (chickenpox) vaccine(15–17)

- Data from the USA have shown no associated increase in shingles rates 30 years post introduction of the chicken pox vaccine
- New data from the UK have shown the burden of disease, when including quality of life (patients and carers), is higher than previously thought
- New data on community cases suggests that when parental time off work is included in analysis, financial burden of even mild cases is far greater
- Exogenous boosting (being exposed to chickenpox) was thought to reduce risk of herpes zoster (shingles) – this is less important as the shingles vaccine is now in use for vulnerable populations in the UK

The JCVI decision not to introduce the chickenpox vaccine in 2009 was largely based on the concern there would be increased rates of herpes zoster (shingles) in the older population if there was no circulating varicella zoster virus providing intermittent boosting to adults. A UK review of herpes zoster case series supported this; adults living with children were 27% less likely to develop herpes zoster, illustrating exogenous boosting(15). A recent UK modelling study predicted a worst-case scenario of a small peak of herpes zoster, 22 years post varicella (chickenpox) vaccine introduction with rates then falling again to pre-vaccine introduction levels(17). The shingles vaccination programme being introduced in 2023 (initially Zostavax®, now Shingrix®) also provides additional protection(11).

Further new evidence demonstrates the quality of life (QoL) loss associated with varicella, for severe cases requiring hospital admission, but also for mild cases remaining in the community. The data for a Portuguese population, showed significant health-related QoL losses in hospital and community arms, for both patients and carers(16). Time off work required for carers was a substantial indirect cost, with an estimated 2.5-5 work-days lost for mild cases, rising to 12 for complicated cases(18).

How do I start talking about the vaccine?

Whilst some parents categorically refuse all vaccination, most are open to discussion about their concerns and choices. Open ended questions and a non-judgemental environment are paramount, with the conversation seeking to understand specific concerns and informational needs of the family. Whilst the ideal outcome is for the child to receive the vaccinations, parents who decline should still feel informed and able to return with further questions. Box 5 has resources that focus on vaccination conversations and has further resources appropriate to signpost families to.

Box 5: Vaccination Communication Resources

For Professionals:

- RCPCH Vaccinology online learning module: https://www.rcpch.ac.uk/resources/vaccines-practice-online-learning
- Vaccine Confidence – Healthy Conversation Tool https://www.healthyconversationskills.co.uk/vaccineconfidence
- UCL podcast 'Injecting Innovation: Creative ways to boost vaccination rates' https://www.ucl.ac.uk/health-of-public/injecting-innovation-creative-ways-boost-vaccination-rates
  Bedford HE, Elliman DAC. Fifteen-minute consultation: Vaccine-hesitant parents.

For Families

- Vaccine Knowledge website: https://vaccineknowledge.ox.ac.uk/home
- Healthier Together – Childhood Vaccinations: https://www.what0-18.nhs.uk/parentscarers/keeping-your-child-safe-and-healthy/childhood-vaccinations-essential-information
- The Australian Immunisation Handbook: Varicella (Chicken Pox).

What if they ask something else?

Communicating openly with parents is vital; including offering to find out information if you do not have it, rather than being vague or evasive. Some concerns of parents and HCPs are answered below(2,5,6), which may also be supported by the resources above (2,5,6).

'Is the protection from the vaccine the same as protection from the disease?'

Neither gives total protection from reinfection, however real-world data suggests equivalent protection between the two. The varicella (chickenpox) vaccine is a live attenuated vaccine (using the vOka strain) to induce the immune response and develop antibodies. Immunogenicity studies on the T-cell response found the vaccine induced memory response is similar to the wild-type virus response, evidenced by specific memory T-cells being present years post vaccination(19). Neither gives universal protection against reinfection, however real-world use suggests equitable coverage. After 25-30 years of use there is evidence to show retained protection amongst women becoming pregnant having had the vaccine in childhood. Pre-vaccination rates of congenital varicella were estimated at 44/year (14)in the USA; since the vaccine introduction hardly any cases have been reported (14).

'We all used to get chickenpox and we were fine, it's not a serious enough disease to vaccinate against.'

Although chickenpox can be mild, complications can include cellulitis, secondary bacterial infections, stroke and death. Data from NHS hospitals in England showed 38% of varicella related hospital admissions had a recognised complication with bacterial skin infections the most common

accounting for 11% of all complications(20). Although overall less than 10% of cases report a complication, even mild cases can make children miserable and itchy(16). Universal vaccination also protects those who cannot be vaccinated (young infants or immunosuppressive conditions) and if uptake is high, can support herd immunity.

'Will this be too many vaccines at once? Can I get them separately?'

The MMRV vaccine has good immunogenicity and long-term protection, demonstrating that the body can develop antibodies to all these antigens at once. Live vaccines need to be given simultaneously or one month apart, to prevent any attenuating effect of one on the other, but there are no concerns around attenuation of any antigen within the MMRV when given in its quadrivalent formula. Many combination vaccine concerns stem from the notorious retracted paper suggesting a link between the MMR and autism – multiple studies since have shown no correlation. The UKHSA has not yet announced the campaign strategy for the varicella roll out, so it's unknown if separate vaccines will be available within the routine schedule, but it is likely they would remain available to purchase privately.

Summary:

The varicella (chickenpox) vaccine has a strong safety profile with real-world efficacy showing a dramatic impact on varicella incidence; severe cases resulting in hospitalisation and death in particular. The UK burden of varicella is substantial in hospital and at home; a universal vaccination programme is likely to have a significant impact on this. Families must have opportunities to discuss concerns with healthcare professionals to enable an informed decision. These conversations require objective knowledge about the vaccine, as well as the communication skills, best gained through practice and experience.

Contributorship Statement

EO, HB, SS, RM and FF were involved in the conceptualisation of the article and its contents. EO wrote the first draft. HB, SS, RM, EW and FF edited and gave feedback on the article. HB provided further resources and references to use. EO collated comments and edits to produce the final version with approval from all co-authors. As corresponding author, FF is the guarantor.

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