Government of Western Australia
Department of Health

Seasonal influenza vaccine formulation TIV and QIV

This year there are two types of inactivated influenza vaccines available in Australia, i.e. Trivalent Influenza Vaccine (TIV) and Quadrivalent Influenza Vaccine (QIV).

TIV has been available for decades and contains antigens from 2 influenza A strains (A/H1N1 and A/H3N2) and one influenza B strain. The influenza B strain antigens can vary annually between one representing the Yamagata-lineage or one from the Victoria-lineage. In 2015, TIVs in the Southern Hemisphere contain vaccine strain antigens from the influenza B Yamagata-lineage.

QIVs are new to the Australian setting and contain the same strain antigens as TIV plus antigens from the B strain-lineage not already included in the TIV. QIVs are designed to ensure that patients are adequately protected against both lineages of influenza B that can co-circulate during a single influenza season. This year QIVs contain additional antigens from the B Victoria-lineage.

The National Immunisation Program is distributing government-purchased TIV in 2015. QIV is not available through the National Immunisation Program this year, but is available for purchase in the private market.

Given the availability of two vaccine formulations, the question arises - “Is QIV substantially better than a TIV?” While the addition of an additional B strain represents a theoretical advantage, assessing the additional clinical benefit of having influenza B Victoria-lineage antigens in the 2015 vaccine is challenging because:

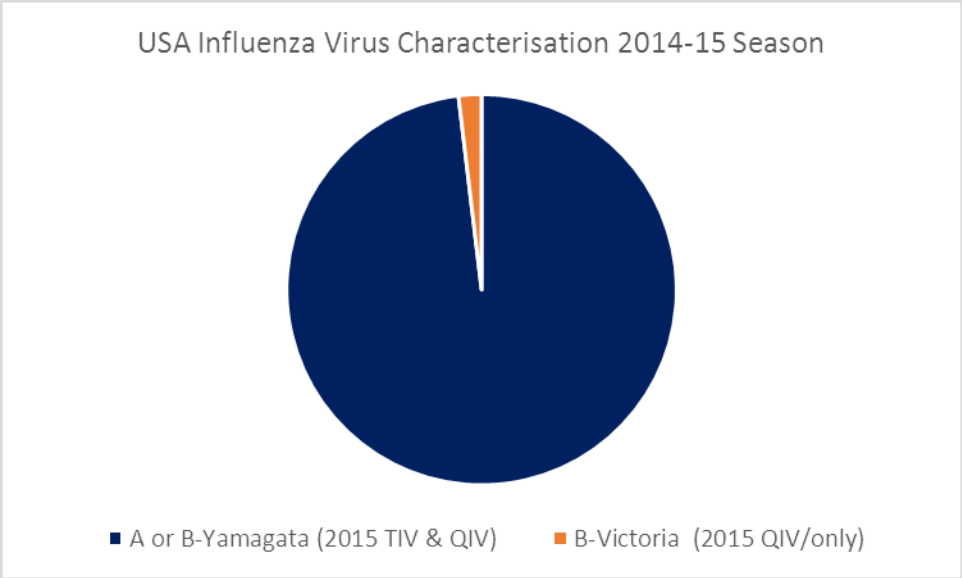
1) As yet, there are no studies showing that the protection afforded by QIV is clinically superior to that provided by TIV. Using clinical end-points, the available published data have found similar estimates of vaccine efficacy for QIV and those reported historically for TIV. While QIV vs TIV studies have shown QIV produces superior antibody titres for the additional B strain, the added clinical benefit of these enhanced titres has not been established.

2) There is limited evidence of clinical cross protection between the B lineage influenza viruses. In a US study during the 2012-13 influenza season, investigators found that the protective efficacy of TIV against B/Victoria (the lineage not contained in TIV) was not significantly different than the protective efficacy against B/Yamagata (the lineage contained in the TIV).

3) The hypothetical advantage afforded by having an extra B-lineage contained in the vaccine is dependent on how widely that B-lineage virus circulates during the influenza season. Of note -

    a. During the most recent influenza season in Europe (2014-15) influenza B accounted for 20.4% of all influenza viruses studied and isolates characterised as B/Victoria-lineage (the lineage contained in the 2014-15 QIV but not the TIV) accounted for just 2.6% of all influenza B isolates.

b. In the US 2014-15 influenza season the proportion of isolates characterised as B/Victoria-lineage (the added B-lineage in the 2015 QIV) accounted for < 2% of all isolates. (See graph).



While one can't predict with certainty how widely the influenza B/Victoria-lineage will circulate in Australia in 2015, the available data do not suggest it will be dominant.

In summary:

The data available to date indicate that, over many influenza seasons, QIV should provide more reliable coverage against both influenza B lineages that could circulate in any given season; however, there is currently very little information as to the extent that this will translate into additional clinical benefit for patients when compared to TIV.

Influenza experts anticipate that the influenza B strain contained in this year's TIV will match the predominant influenza B strain circulating in Australia in 2015. Therefore, TIV offered through the National Immunisation Program in 2015 is anticipated to offer good protection against the influenza strains prevalent during the upcoming influenza season.

The potential additional benefits of using QIV in preference to TIV will be reassessed as more information becomes available.

References:

1) Langley JM, Carmona Martinez A, Chatterjee A, et al. Immunogenicity and safety of an inactivated quadrivalent influenza vaccine candidate: a phase III randomized controlled trial in children. J Infect Dis 2013;208:544-553
2) Domachowske JB1, Pankow-Culot H, Bautista M, Feng Y, Claeys C, Peeters M, Innis BL, Jain V. A randomized trial of candidate inactivated quadrivalent influenza vaccine versus trivalent influenza vaccines in children aged 3-17 years. J Infect Dis. 2013 Jun 15;207(12):1878-87. doi: 10.1093/infdis/jit091. Epub 2013 Mar 7.
3) http://www.cdc.gov/flu/weekly/
4) http://www.ecdc.europa.eu/en/publications/Publications/ERLI-Net-report-February-2015.pdf

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