The Immunological Basis for Immunization Series

Module 23: Influenza Vaccines

Immunization, Vaccines and Biologicals

World Health Organization

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Contents

Abbreviations and acronyms

APC	Antigen presenting cells
att	Attenuated (property of live-attenuated influenza vaccines)
ca	Cold-adapted (property of live-attenuated influenza vaccines)
CI	Confidence interval
CMI	Cell-mediated immunity
EID	Egg infectious dose
FFU	Fluorescent focus units
GBS	Guillain-Barré syndrome
GISRS	Global Influenza Surveillance and Response System
HA	Hemagglutinin
HA1	Globular head region of the hemagglutinin protein
HAI	Hemagglutination inhibition
HGR	High-growth reassortant
HLA	Human leukocyte antigen
IIV	Inactivated influenza vaccine
ILI	Influenza-like illness
LAIV	Live attenuated influenza vaccine
M	Matrix protein
MDCK	Madin-Darby canine kidney
MDV	Master donor virus
µg	Microgram
MN	Microneutralization
MP	Matrix protein
M2	Matrix protein 2
NA	Neuraminidase
NIC	National Influenza Centre
NP	Nucleoprotein
OR	Odds ratio
ORS	Ocular respiratory syndrome
PA	Polymerase acidic protein
PAMPs	Pathogen-associated molecular patterns
PB1	Polymerase basic protein 1
PB2	Polymerase basic protein 2
PRRs	Pattern recognition receptors
RCT	Randomized controlled trial
RIDT	Rapid influenza diagnostic test
RT-PCR	Reverse transcription-polymerase chain reaction
SAGE	Strategic Advisory Group of Experts on immunization
SRID	Single radial immunodiffusion
SV	Sub-virion (includes both split and purified surface antigen vaccines)
ts	Temperature-sensitive (property of live-attenuated influenza vaccines)
VAERS	Vaccine Adverse Event Reporting System
VE	Vaccine effectiveness
WHO	World Health Organization

Preface

This module is part of the WHO series *The Immunological Basis for Immunization*, which was initially developed in 1993 as a set of eight modules, comprising one module on general immunology and seven modules each devoted to one of the vaccines recommended for the Expanded Programme on Immunization, i.e. vaccines against diphtheria, measles, pertussis, polio, tetanus, tuberculosis and yellow fever. Since then, this series has been updated and extended to include other vaccines of international importance.

The main purpose of the modules is to provide national immunization managers and vaccination professionals with an overview of the scientific basis of vaccination against a range of important infectious diseases. The modules developed since 1993 continue to be vaccine-specific, reflecting the biological differences in immune responses to the individual pathogens and the differing strategies employed to create the best possible level of protection that can be provided by vaccination. The modules also serve as a record of the immunological basis for the WHO recommendations on vaccine use, published in the WHO vaccine position papers.[1]

This module concerns vaccines against influenza, an infectious disease of worldwide public health importance which presents unique immunological challenges. The vaccines are also unique, their content necessitating reformulation prior to each annual influenza season and requiring annual re-vaccination. The module answers the questions that stem from the exceptional nature of the influenza viruses and their capacity for rapid mutation and antigenic change, and the need to align vaccine development with those characteristics, now and in the future. The existing types of influenza vaccines and the immune responses to them are described, and future needs and prospects are outlined.

[1] See: *http://www.who.int/immunization/documents/positionpapers_intro/en/index.html*, accessed 10 Aug 2017.