

# Anaphylaxis and other adverse events





## To be able to manage anaphylaxis and other adverse events correctly

Immunisation Department, Centre for Infections

## Learning outcomes



- •Define local and systemic adverse events
- •Distinguish between anaphylaxis and fainting
- •Manage anaphylaxis
- •Prepare and check the equipment and drugs used for managing anaphylaxis
- •Define and recognise an adverse event
- •Report an adverse event

## **Classification of Adverse Events Following Immunisation (AEFI)**



Vaccine-induced AEFI

Induced direct effects of vaccine or vaccine component and/or due to underlying medical condition or idiosyncratic response in recipient

Programmatic errors

Incorrect doses or routes, wrong diluent

Coincidental events

Chance happening

Injection reaction

Result of injection itself, not the vaccine e.g. pain, anxiety

Unknown

Cause cannot be determined

## **Types of adverse event**



#### Local Reactions

More common with non-live vaccines containing adjuvants (Pain, redness, swelling at injection site)

## •Systemic Reactions

Generally more common following live vaccine, but less severe with subsequent doses (Fever, headache, loss of appetite)

#### Allergic Reaction

Anaphylaxis/Severe systemic allergic reaction

## Systems for monitoring/reporting AEFI



•Yellow card System

Passive reporting by doctor, pharmacist, nurse, patient or parent to the Medicine and Healthcare Products Regulatory Agency (MHRA)

http://medicines.mhra.gov.uk/

Immunisation programme / public health agency

•Special schemes (specific condition)

e.g.. British Paediatric Surveillance Unit (BPSU) in UK

## What is anaphylaxis?



Definition of anaphylaxis

Typically rapid and unpredictable with variable severity and clinical features including cardiovascular collapse, bronchospasm, angioedema, pulmonary oedema, loss of consciousness and urticaria

- Potentially life threatening AEFI
- One of four types of hypersensitivity reactions
- Very rare approx one per million vaccine doses

(Bohlke et al. Risk of Anaphylaxis After Vaccination of Children and Adolescents Pediatrics 2003; 112:815-820)

## What happens during anaphylaxis



Essentially an inappropriate immune response

➢Occurs as a result of exposure to an allergen to which a person has been sensitised and previously made specific immunoglobulin E (IgE)

Anaphylaxis can occur on re-exposure to the antigen when explosive amounts of histamine and other chemical mediators are released following the binding of the antigen to IgE coated mast cells.

## **Potential triggers**



## •Various common food and non food triggers

- (Nuts, shellfish, dairy products, wasp or bee stings, latex, antibiotics, antiinflammatories)
- •Vaccine specific
  - Egg proteins (yellow fever and influenza vaccines)
  - *Thiomersal* (some flu and hep B vaccines)
  - Antibiotics (Neomycin streptomycin and polymixin B)
  - Toxoid (DTaP, Td)

Stabilisers and other vaccine components (Yeast, gelatin)

Distinguishing signs and symptoms of anaphylaxis and a faint:



In groups list the signs and symptoms of anaphylaxis and a faint

- **Cardiovascular system**
- **Respiratory system**
- **Gastrointestinal tract**
- Skin
- **Central nervous system**





- Airway swelling of tongue , throat
- **Difficulty breathing**
- Hoarse voice, stridor
- Breathing shortness of breath
- **Increased respiratory rate**
- Wheeze
- Hypoxia confusion
- **Respiratory arrest**



- <u>Circulation</u> Signs of shock
- Pale, clammy, tachycardia, hypotension
- **Decreased conscious level**
- **Cardiac arrest**
- Do not stand patient up



- Disability sense of impending doom
- Anxiety, panic
- **Decreased conscious level**
- Exposure skin changes in over 80%
- **Erythema / Uticaria**
- Includes mucosal changes Angiodema

#### Signs & Symptoms

## <u>Mild</u>

Flushed Appearance Urticaria Anxiety Headache Nausea

**Abdominal pain** 







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## Signs & Symptoms

#### **Moderate**

Feeling of Impending Doom! Swelling Dyspnoea Wheeze Stridor Tachycardia

**Classic features of Moderate Anaphylactic reaction** 

Swelling of lipsUrticaria





#### <u>Severe</u>

Angioedema (Including Pharyngeal/Laryngeal)

**Hypotension** 

Cyanosis

Collapse

**Respiratory or cardiac arrest** 

DEATH!!!

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## **Management of anaphylaxis**



Call for assistance

 Lie patient down with legs raised (unless breathing difficulties)

 Where available administer oxygen (10-15 Litre/min)

 If showing clinical signs of shock, difficulty breathing or deteriorating consciousness administer intramuscular adrenaline into anterolateral aspect of thigh

 Repeat dose if no clinical improvement

Age	Dose of adrenaline
	1:1000 (1mg/ml)
Less than 6 mths	0.15ml
6 months- 6 yrs	0.15ml
6-12 years	0.3ml
Over 12 years	0.5ml or
	0.3ml (if small
	or prepubertal)



Minimum slide set created by:

Immunisation Department, Centre for Infections, Health Protection Agency

#### to assist teaching of the Core Curriculum for Immunisation Training

(see http://www.hpa.org.uk/infections/topics\_az/vaccination/training\_menu.htm)