PERIOPERATIVE ANAPHYLAXIS UPDATE

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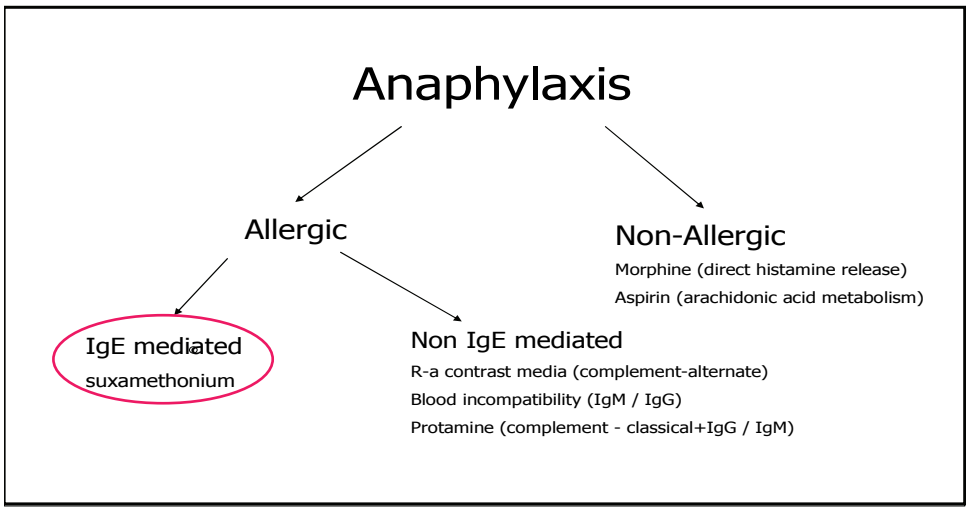
ANZCA has approved the formation of a SIG which will be called the Australian and New Zealand Anaesthetic Allergy Group – ANZAAG. The challenging aims, in the first instance, will be to standardise testing, reporting and produce a data-base. The New Zealand Group, which now consists of 10 centres, has been in existence for five years, and has already produced a referral form. The draft was produced by Lucas Sikiotis from Waikato.

Definitions

These have been altered. However, the fundamental definition of anaphylaxis still remains: a severe life-threatening generalised or systemic hypersensitivity reaction.

The European group of allergists and immunologists (2003) defined this condition according to the pathological cause: allergic or non-allergic.



Two years later the Americans (SNIAID / FAAN 2005) preferred a more clinical definition, based on the signs, which include skin changes, respiratory and / or cardiovascular responses. It was considered that, if these signs were apparent, therapy would be more rapidly instituted. The word “anaphylactoid” has now been eliminated.

Tryptase

Many mediators are released in an anaphylactic reaction, both pre-formed and newly formed. From a clinical view-point, the most useful is tryptase, as it is a stable protease which reaches its maximum level 1 to 2 hours after the event. Tryptase is present in mast cells, which are found in skin, mucous membranes and connective tissue. It is not present in basophils which also are involved in anaphylactic reactions.

It is therefore important to know when to take blood samples for serum tryptase: 1-2 hours after the event; a second one at 6-8 hours later and a third sometime after 24 hours. This last sample is the base-line level of this mediator for that patient. Our Clinic has picked up as least 4 patients with systemic mastocytosis by noting that the base-line level is abnormally high.

Guidelines for the management of anaphylaxis in adults

Is this anaphylaxis? Assess ABC
ONE OR MORE OF:
CVS - hypotension, collapse, myocardial ischaemia, arrhythmias, pulmonary oedema
Respiratory - cough, bronchospasm, stridor, raised airway pressures, hypoxia
Cutaneous - flushing, urticaria, oedema of face and lips

→ No → Consider another diagnosis

↓ Yes

Immediate management
Discontinue suspected allergen
Call for help
Discontinue surgery (if feasible)
100% Oxygen
Consider intubation early (possibility airway oedema)
Adrenaline - titrate to effect
IMI - **1:1,000** (1mg/ml) 0.25ml - 0.5ml in thigh
IVI - **1:10,000** (1mg/10ml) 0.5ml - 1ml boluses
Infusion - **1:10,000** (1mg/10ml) 3ml/hr - 30ml/hr
IV fluids
Plasmalyte 10ml/kg rapidly, repeat prn (may need to give several litres)

↓ Good response to treatment? → No

↓ Yes

Secondary management
Antihistamines: Promethazine 1mg/kg IV
Ranitidine 50mg IV
Corticosteroids: Hydrocortisone 200mg IV
Investigations: ABG prn
Coagulation screen
TEG
Tryptase at 1 and 6 hours
Electrolytes
FBC

CPR and ACLS if indicated
Intractable bronchospasm?
Salbutamol 250mcg IV loading dose and 5-20mcg/min infusion
Ventilation at <5/minute
Consider auto PEEP or tension pneumothorax
Adrenaline resistance?
May occur in patients on beta blockers or with an epidural in place
Consider glucagon, noradrenaline, TOE, CPB.
Persistent severe acidosis after 20 minutes of treatment?
Sodium bicarbonate or THAM

↓

Consider whether to abandon surgery

↓

Observation
Monitor closely for at least several hours
Consider 24 hour DCCM admission
May get late/biphasic reactions 8-12 hours later
Anaphylaxis may last up to 32 hours despite aggressive treatment

- THIS IS A LIFE THREATENING EMERGENCY -

1. **Prompt recognition of signs and symptoms of anaphylaxis is crucial.**
2. **Adrenaline administered early and in adequate doses is the mainstay of treatment of anaphylaxis.**
3. **Appropriate volume replacement is essential.**

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Incidence of Peri-operative Anaphylaxis

Reports vary widely; 1:4,000 (France) to 1:20,000 (Boston Collaborative Study 1989). It is estimated that in the Greater Auckland region the incidence is around 1:4,500.

The Auckland Anaesthetic Allergy Testing Clinic (AATC)

The tests performed are prick tests, intradermal tests and, when appropriate, specific IgE tests. These latter tests which are used by the AATC are for latex, penicillin G & V, suxamethonium and chlorhexidine. Auckland is the only centre to have the chlorhexidine specific test.

Around 100 patients are referred to the AATC each year. These referrals are triaged and between 70 – 80 patients are tested annually. Referrals are received, not only from anaesthetists and intensivists, but also from many other medical practitioners. There is a close collaboration with the Department of Clinical Immunology and occasionally referrals overlap. The clinic is held every 4 weeks when usually 6 patients are skin-tested. Auckland is very fortunate in having a strong laboratory Immunology Department. The specialist technicians produce the dilutions required for intra-dermal testing and also perform the testing.

Results

35% of all patients test positive. However, the figure rises to 51% when referrals from anaesthetists and intensivists only are assessed.

Suxamethonium is still the most frequent cause of peri-operative anaphylaxis. Rocuronium is the second most frequent culprit, but its incidence appears to be declining in recent years. Whether this is due to reduced use of this drug or a change in formulation, is unknown. Reasons as to why this muscle relaxant produces anaphylaxis, not only on its first administration, but also at the first general anaesthetic for that patient are outlined. International studies are still on-going. It appears that the ancillary agents used peri-operatively are becoming more of a problem in causing anaphylaxis. These include chlorhexidine, Patent Blue Dye (which is reported to have an incidence of 1:100 for sentinel node localisation), antibiotics, especially penicillins and cephalosporins, and gelatine-containing solutions.

Some unexpected conditions, such as systemic mastocytosis, reactions to local anaesthetics and cold urticaria, have been diagnosed.

A few case reports are presented.

"Anaphylaxis Boxes"

It is worth considering providing an 'anaphylaxis box' in a readily accessible area. We provide: blood request forms, appropriate blood sample tubes, guide-lines for intractable cases and a reminder when to take samples for serum tryptase levels. No drugs are kept in these boxes as adrenaline is in the emergency drawer of the anaesthetic locker.

Referral Forms

Other centres may modify this to suit their hospital and situation –

Referrals to the AATC

- New four page referral form: public and private
- www.healthpoint.co.nz *Go to*
  - Anaesthesia
  - Auckland DHB Anaesthesia
  - *(under quick links)* Referral Expectations
  - *(hyperlink at bottom of section)* Referral Form

Summary

Increasing awareness, improved skin-testing techniques and the avoidance of certain agents will hopefully reduce the incidence of life-threatening peri-operative anaphylaxis.

However, there will always be the unexpected!

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