SEPSIS

&

Surviving Sepsis Campaign

(from a ward point of view)

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"SEPTIC ATTACK!"

The sepsis syndrome

Redefined almost 20y ago USA

Forget septicaemia, bacteraemia, blood poisoning, viraemia, etc

Now standardised terminology

Used as basis for all decent R&D, EWS, current practice

Forms part of practice for almost every speciality

Dynamic spectrum ranging from SIRS/sepsis/severe sepsis/septic shock/MOF/death

SIRS

Systemic inflammatory response syndrome

Clinical scenario and 2/4 of following:

- Temp <36 or >38
- RR > 20 or PaCo2 < 32mmHg (4kPa)
- HR > 90/min
- WCC < 4 or > 12

Early and very common BUT do not underestimate its significance

Mortality up to 20%

Sepsis:

Presence of SIRS in presence of infection of any cause, either confirmed or strongly suspected (positive cultures not required for diagnosis and in any case 50% will be negative)

Eg; pneumonia, wound infection, UTI, line infection

Severe Sepsis:

Sepsis with CVS compromise resulting in organ hypoperfusion or hypotension (inc. oliguria, confusion, lactic acidosis).

Hypotension defined as fall in systolic > 40mmHg or absolute < 90mmHg

In terms of EGDT a MAP < 65mmHg should be an alert and a target in the first instance

Responds to fluids

Very common scenario but often mistreated in terms of fluid used, volume given and escalation

Septic shock:

Hypotension or hypoperfusion refractory to fluids alone

Usually marked hypotension to the point of collapse

Common but also frequently mistreated but in addition will need an inotrope so beyond ward care

Often presents as fast bleep or cardiac arrest call

“Long way down the line”

May be beyond salvage

MODS/MOF:

Multiorgan dysfunction syndrome/multiorgan failure

Loss of organ homeostasis such that death will follow if no intervention

Unfortunately common presentation as cardiac arrest call

Mortality for in house cardiac arrest >>90% and essentially zero for >85y

Syndrome criteria can also be used as a guide to outcome as mortality rate rises along the line;

Roughly 20% for every organ failed plus starter of 20%

“Will die” if 4 organ failure and “certain to die” with 3 organ failure

Odds against even with 2 organ failure eg needs inotrope and NIV

On other words act and refer EARLY

Surviving Sepsis Campaign (SSC) guidelines for management of severe sepsis and septic shock

International committee

2 reports 2004 & 2008

One of the most useful and comprehensive starting points for advanced care but also excellent guide for front line staff

Early Goal Directed Therapy (EGDT)

First 6 hours of resuscitation (too long!!)

- CVP 8-12 mmHg (non ventilated) (approx 10cmH_2O)
- MAP > 65mmHg
- UO > 0.5ml/kg/h
- Central venous > 70% or mixed venous saturation > 65%
- Hct > 30% (Hb 10)
- (SPO2 > 94%)
- Antibiotics, fluids, blood, inotropes

- Achievable in 99% of patients
- 16% absolute reduction in 28/7 mortality (30 v 45%)
- Better pH, lactate, base deficit, and APACHE II scores (marker of organ dysfunction)
- Suitable for ward/A&E care
- Simple commonsense practical philosophy

- NICE 11/07
- Medical plan in notes
- Targets in notes and on Obs chart
- VERBAL communication with nurses and colleagues
- On going track and trigger system (EWS)
- In addition could/should add additional targets that are those routinely recorded but tie in with SIRS/ALERT/NICE guidelines (Sats>94%, HR<90, BP>100, temp<38>36)

Oxygen

- Not mentioned directly but ……
- Referenced as SVO_2, lactate, base deficit
- None of the above easy so start with SPO_2. ABG comes early but is not the first test and saves no lives.
- In addition $DO_2 = SPO_2 x Hb x CO$ and failure to achieve this results in cell death
- High flow high concentration in ALL septic (and otherwise unwell) patients no matter what the state of their lungs
- Non-rebreathe mask at 15l/min
- NEVER do ABG on air

Fluids

- "Never" 5% dextrose
- 4% dextrose/0.8% saline not much better in this setting
- Hartmann's, 0.9% saline or colloid
- Crystalloid v colloid no difference
- Ratio of about 3:1 and give as much as it takes which could well be several litres or more
- "Breathlessness and creps" ≠fluid overload
- Run stat through short fat line (orange)
- Poiseuille's law ($Q = Pnr^4/8ul$)

Microbiology

- Antibiotic in first hour: (don't delay for blood or other cultures but remember these are important)
- Hospital protocol for drugs (minimise C Diff and MRSA)
- Surgical drainage/debridement or removal of septic focus

Steroids

- Only in the ICU setting
- Hydrocortisone 200-300mg 7 days if needing inotropes
- Not relevant to ward practice

Glucose Control

- Only relevant to ICU setting
- Not practical and frankly dangerous in ward area so stick to 4-11
- Tight control 4.4-6.1 relaxed to 4.4-8.3 /10 mmol/L
- Absolute mortality down by 32% (4.6 v 8%)
- Further sepsis reduced by 46%
- Reduced LOS
- Reduced ARF and polyneuropathy

Recombinant activated protein C (Xigris)

- Only for use in ICU
- For use in patients with high risk of death (APACHE II>25), sepsis induced MOF, septic shock or septic-induced ARDS and no absolute contraindication related to bleeding or relative contraindication that outweighs the benefit
- ITU consultant use only
- NTT = 16

Haematology

- EGDT says Hb 10
- Blood transfusion for Hb<7 with target of 7-9g/dl (after initial resuscitation)
- Routine use of FFP in absence of bleeding or planned procedures not advisable
- Platelets to be given if count ($x10^9$/l) <5 or if 5-30 and risk of bleeding or >30 and planned procedure

Miscellaneous

- Bicarbonate not advisable unless pH<7.15 (and ventilated)
- DVT prophylaxis with heparin and TEDS unless contraindicated
- Stress ulcer prophylaxis with H_2 antagonists (PPIs)
- Discuss advance care planning with patients and families
- Remember the MCA, DNAR status and LCP
- Remember organ and tissue donation