FEBRILE POST OPERATIVE PATIENT

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SUMMARY

Post operative fever is a clinical presentation of varied aetiology. Although most of the times there is an obvious cause for the fever ,at times it presents with a difficult to diagnose cause of fever. Anaesthesiologists attending the patients in PACU often face this problem. Early diagnosis and management is warranted to prevent possible complications and to shorten the stay in PACU.

Keywords

Post operative fever, PACU, diagnosis.

Fever is an acute phase response of the immune system of the body to the pyrogenic stimuli like microorganisms or their products, inflammatory processes or tissue injury

It is triggered by the release of various cytokines, notably interleukin-1 beta, tumour necrosis factor and interleukin-6 , that are capable of causing secretion of prostaglandin-E_2 in the hypothalamus. Prostaglandin-E_2 binds to prostaglandin receptors on neurons in the ventromedial preoptic area and the

preoptic nucleus. Activation of these receptors triggers a number of neurohumoral and physiological changes that lead to increased body temperature.

The endogenous opioid system is also thought to play a role in thermoregulation.

Fever can simply be defined as an increase in the body temperature, the normal temperature being $36.8^0 + 0.4^0$ C. A core temperature (i.e. rectal, pulmonary artery, oesophageal, bladder, tympanic membrane) of more than 38^0 C should be regarded as a definitive evidence of fever.

Post operative fever is usually due to non-infectious causes and is most of the times benign. Fever itself is not associated with increased mortality although prolonged fever can be dangerous. Patients may have more than one cause and both infectious and non- infectious causes can co-exist. In as many as 30% of such patients, the cause of fever remains undetected despite multiple diagnostic tests.

Post –operative fever is more likely to be due to infections, as the time interval following surgery increases.

High fever with rigors could be due to a pyrogen reaction from an infusion, or to a drug reaction, while minimal temperature elevations, and normal or subnormal temperatures may be associated with life threatening sepsis.

Some studies claim that non-infectious causes of fever rarely result in a core temperature greater than 38.9^0 C, although rigorous data in support of this view are lacking. By the same token, infections are rarely if ever, associated with core temperature greater than 41.1^0 C. When the core temperature is high, the clinician should suspect malignant hyperthermia, neuroleptic malignant syndrome or heat stroke.

Anaesthesia influences thermal balance by altering autonomic and behavioural responses to thermal stresses imposed on the body. An anaesthetised patient cannot bring about changes to retain or generate heat like a conscious

patient. And these effects continue to influence during the early post operative period.

Enflurane and Isoflurane produce increase in the skin temperature at higher concentrations. (Anaesthesia Review -8. Sweating and thermoregulation in anaesthesia; C.S.Martin; A F Asbury)

Atropine is known to interfere with cutaneous cooling leading to post operative fever.

About 10% of patients develop an increase in the temperature in the first week of surgery even in the absence of wound or other infections. Most such fevers are mild to moderate, occur as a single episode and are short lasting. Expensive investigations are best deferred. Very rarely a sterile serous collections beneath a portion of surgical wound can produce a low grade fever mainly occurring in the afternoons or evenings for 8-12 days till the serous collection is absorbed or drained.

A low grade fever may be due to thromboembolism. The risk is highest in immobilized patients. Careful examination for painful swelling of the calves and thighs and for tenderness over the course of large veins in the lower limbs is at times rewarding. Even so pulmonary emboli may be shot out from thrombi in the deep veins of legs, thighs or pelvis without the presence of physical signs of the same.

Blood in the body cavities like thorax and abdomen and in the subarachnoid space can produce fever. A large hematoma in any organ or tissue occurring spontaneously as in certain diseases, or following trauma or rupture of an aneurism also produces fever.

Self limiting hyperthermia is occasionally caused by closed draping or aggressive heat preservation in the operating room. Therefore hypothermia must be

treated to achieve near normal temperature and not normal or above normal , as the temperature could continue to rise producing hyperthermia .

Extensive burns and scars destroy the sweat glands and such patients may develop rise in the body temperature post operatively.

Total body radiation abolishes sweating for about six months and such patients may develop fever in the post operative period.

In a patient with diabetic autonomic neuropathy induced anhydrosis , the body temperature in the post operative period can rise .

The efficiency of sweating as a mechanism of heat loss is hindered by humidity, absence of wind and clothing . In these circumstances a greater volume of sweat is required to achieve the same amount of cooling.

Acute lesions in the preoptic anterior region of the hypothalamus such as haemorrhage and trauma can produce anhidrosis, leading to fever.

Unrecognised intrapoerative aspiration sometimes presents with fever in the PACU. Atelactasis or respiratory infection due to lost lung volumes following lobectomy or pneumectomy, or due to retained secretions after such procedures can lead to fever in the post operative period.

Exacerbation of infections during tonsillectomy or apppendicectomy, abscess drainage, urinary tract manipulations are other causes of fever. Emergence of preexisting influenza, sinusitis, otitis, due to suppressed immune functions, especially in patients who receive steroids, could produce fever in PACU.

When all the infectious causes of fever in a patient in PACU are ruled out, the fever then becomes a cardinal sign of ongoing infection. Therefore, a thorough diagnostic evaluation should be triggered, looking for the cause.

Recent history of the patient`s illness gains importance to come to a diagnostic conclusion. For instance –CNS infection should be suspected in a patient with ongoing CNS instrumentation and if a patient recently underwent a

gastrointestinal surgical procedure, intra abdominal source of infection should be suspected.

SIRS (SYSTEMIC INFLAMMATORY RESPONSE SYNDROME .)

This is a proinflammatory state where in fever is but one clinical manifestation. This could be seen in postoperative patients and can lead to organ dysfunction and death.

A thorough comprehensive physical examination should be carried out to find out or rule out infections,in a patient who develops fever in the post operative period.

Infectious causes of post operative fever

- Wound infection
- Transient endotoxaemia or bacteremia associated with procedures.
- Thrombophlebitis.
- Infection of intravenous cannula site.
- Meningitis
- Encephalitis
- Urinary tract infection, due to prolonged catheterization.
- Pneumonia

Non –infectious causes of fever

- Transfusion reaction.
- Deep vein thrombosis.
- Opioid withdrawal syndrome.
- Atropine

- Alcohol withdrawal.
- Hyperthyroidism.
- Adrenal insufficiency.
- Phaeochromocytoma.
- Devitalised tissue following trauma.
- Bowel infarction.
- Postcardiotomy syndrome.
- Drug fever.
- Hypothermia blankets.

When an infection is detected , appropriate antimicrobial therapy should take care of the condition. If there is no obvious source of infection and the patient is not deteriorating clinically, it is reasonable to obtain blood cultures and in the mean time consider the possibility of non infectious causes of post operative fever. Treat the patient symptomatically and observe for forty eight hours. If the fever is due to a non infectious cause, it usually subsides in this period.

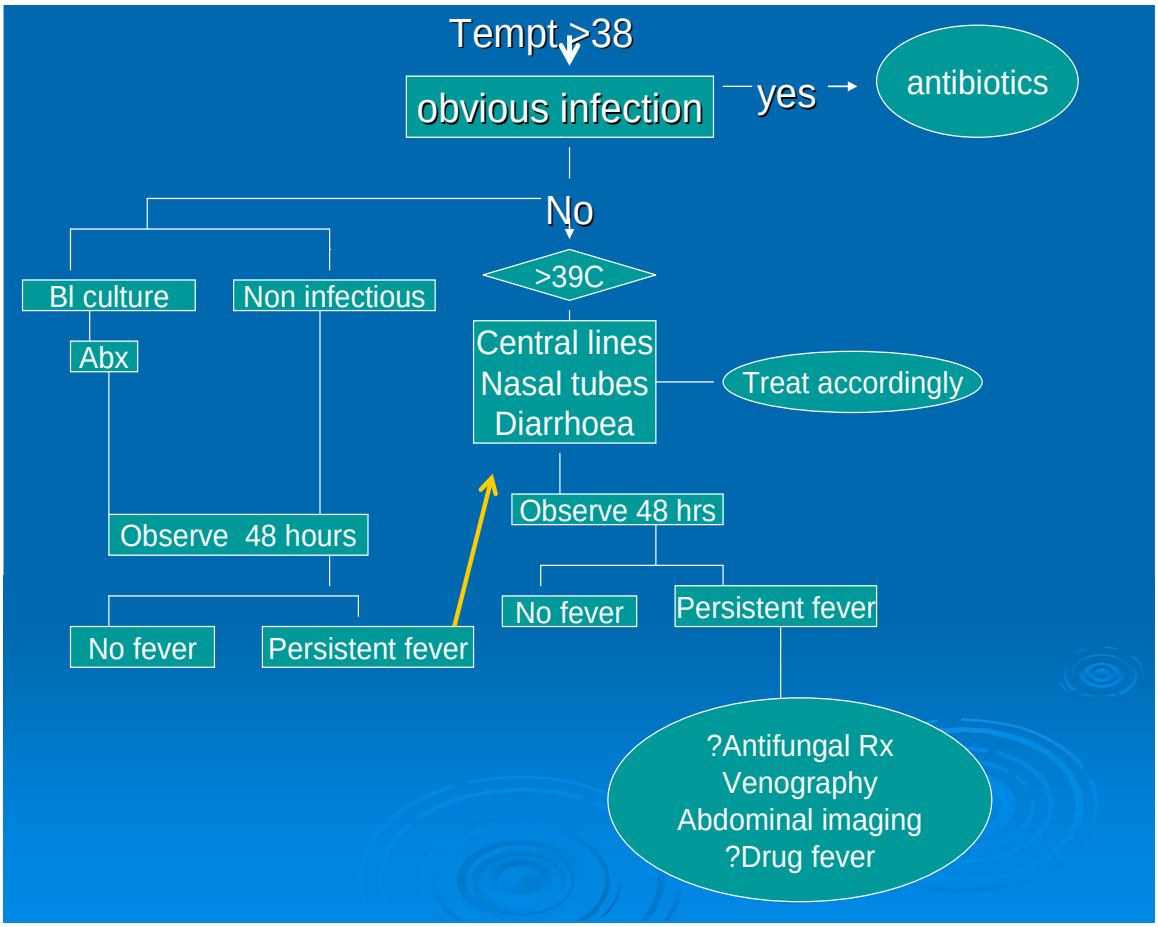
If the fever is persistent or increasing, that is if the core temperature is $>39^0$C (and $<41^0$ C—the causes being malignant hyperthermia, thyroid storm, neuroleptic malignant syndrome) and/or is accompanied by signs of worsening such as increasing confusion, arterial hypotension, oliguria, rising serum lactate concentrations, falling platelet count or worsening coagulopathy, then additional diagnostic studies are to be carried out, like—

- Central line, if present for >48 hours, it is to be removed and culture sensitivity studies done, and treated accordingly .

- Nasal tube if present for >48 hours, it is to be removed and culture sensitivity studies done, and treated accordingly, and C T sinuses done.

Observe the patient for 48 hours, if the fever persists—Antifungal treatment might help.

- Venography done to rule out thrombophlebitis.
- Abdominal imaging techniques could help in locating focus of infection.
- It could be a drug fever, and the patient could become afebrile once all the drugs are stopped.



TREATMENT

The treatment is mainly supportive.

- Antipyretics
- Tepid sponging
- Proper fluid therapy , considering the increased volume loss in a febrile hyperventilating patient. Fever increases the water requirement to a variable degree. Hyperventilation due to fever results in increased water loss by evaporation and water is also lost through skin. A patient with a core temperature of 103^0F (39.4^0 C) will require an average of an additional 500ml of water per day. The endogenous water production associated with the hypermetabolism of fever is also increased, but is not enough to offset the increased losses.
- Antibiotics
- Strict asepsis to prevent cross infection .
- Good post-operative analgesia .
- Chest physiotherapy if indicated.
- Oxygen therapy, as the demand for oxygen increases in a febrile patient. For every 1^0 C rise in the body temperature the metabolic rate and thereby the oxygen requirement of the body increased by 13%.

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