

ABSTRACT

Awareness of pitfalls in common clinical symptoms is important. Not all patients with ACS presents with chest pains (beware of patients presenting with syncope, diaphoresis, dyspnoea, pain upper back, etc.). In a breathless patient, anxiety and other psychiatric conditions should only be considered as the diagnosis after careful exclusion of other life threatening causes: metabolic acidosis, partially occluded upper airway, bronchospasm, and pulmonary embolism. In a patient with headaches, intracranial haemorrhage, meningitis/encephalitis, and brain mass lesion need to be considered in the differential diagnosis. The elderly patient presenting with acute abdominal pain will require FPs to maintain a high index of suspicion for potential life threatening causes. Possible causes of serious backache are ACS, AD, AAA, and spinal cord compression. In the wounded patient, there is a need to determine the medical condition that may have resulted in the patient's injury, and patient's risk profile is as important as the wound profile for correct management. In the pregnant patient, dyspnea can be due to pulmonary embolism, or heart failure; placenta abruption from abdominal injury may not have the classical triad of pain, tenderness or vaginal bleeding.

Keywords: acute chest pain, acute coronary syndrome, breathlessness, headaches, abdominal pain, wound, injury, pregnant patient

SFP2014; 40(1) Supplement: 33-37

INTRODUCTION

Family Physicians (FP), practising primary care in Singapore, are likely to see patients presenting with varying acuity and clinical problems. Within this varied group of patients, the majority of which is likely to require basic evaluation at the clinic/office setting with minimal investigations. When an acute patient (e.g. acute on going chest pain in a patient with multiple coronary artery risk factors) presents, FPs are well prepared in recognising the possibility of acute coronary syndrome (from history and physical examination and ECG, when available), initiate acute intervention (e.g. providing sublingual nitrates) and arrange for urgent referral to the Emergency Department (ED).

However, our patients with acute medical and surgical emergencies do not always present with classical textbook description, at times making clinical diagnosis a challenge

Common "benign" symptoms can represent initial presentation of acute life threatening emergencies. Overlooking

and under recognition can result in grave consequences for both patient and physician.

The objective of this article is to describe some common pitfalls that FPs, practising in Singapore, may encounter in their clinical setting and provide guiding principles for safe and prudent clinical practice. Learning points and pitfalls will be highlighted as case studies during the series workshops.

ACUTE CHEST PAINS AND ACUTE CORONARY SYNDROME (ACS)

One of the most important life threatening causes of acute chest pains is acute myocardial infarction (AMI). Its diagnosis requires the presence 2 out of 3 factors namely chest pains, acute electrocardiogram (ECG) changes or raised cardiac biomarkers. Without the availability of ECG, blood tests, and short of referring all chest pains to ED, FPs have to rely on history and physical examination to exclude possibility of ACS. Diagnosis of ACS is often made based on typical history of exertion chest pain with its central location and radiation to neck, jaw, left upper limb associated with diaphoresis and dyspnoea. However, ACS (including AMI), can occur without chest pains ("Silent MI"). Patients with history of heart failure/strokes, elderly, diabetes, and females can present with AMI without any overt chest pains¹. Patients have been known to present acutely with "unexplained" diaphoresis (after having excluded possibility of hypoglycaemia in diabetics) or sensation of dyspnoea (more typically exceptional dyspnoea) and astutely diagnosed as probable ACS and referred appropriately through EMS to EDs for evaluation.

A resting ECG is an important first investigation which all patients with acute chest pains should have at point of care. ST changes and arrhythmias can be picked up and provide certainty to the diagnosis. However, the absence of typical ST changes in a resting ECG does not exclude the possibility of ACS. Table 1 list some of the pitfalls in diagnosis of ACS.

TABLE 1. COMMON PITFALLS IN PATIENTS WITH ACUTE CHEST PAINS AND ACS

1. Not all patients with ACS presents with chest pains (beware of patients presenting with syncope, diaphoresis, dyspnoea, pain upper back, etc.)
2. Thinking that a normal resting ECG excludes AMI
3. Tenderness on palpation of the chest wall and concluding that it is a musculoskeletal cause
4. Resolution of pain with antacids and gastric medications does not always point to non ACS cause
5. Reliance on one initial cardiac enzyme to rule out ACS
6. Not thinking about other life threatening causes of chest pain
 - a. Pneumothorax
 - b. Acute aortic dissection
 - c. Acute pulmonary embolism
 - d. Pericarditis/Myocarditis
 - e. Boerhaave's syndrome (Rupture esophagus)
7. Not examining the chest and back for rashes (e.g. Herpes Zoster)

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THE BREATHLESS PATIENT

FPs should not have a problem identifying the acutely ill patient who is breathless and tachypneic. Such patients often have background history of pulmonary (e.g. bronchial asthma, COPD or cardiac (e.g. congestive heart failure) related conditions with detectable clinical signs. For those who do not have chronic diseases and previously fit and well, acute breathlessness without any antecedent respiratory symptoms (such as cough, running nose) may lull FPs into thinking of Hyperventilation (e.g. secondary to Panic attack) as the cause. Patients with history of psychiatry and behavioural conditions (e.g. anxiety and depression) may be erroneously “labelled” as having hyperventilation attacks. One must not forget that Pulmonary Embolism (PE), and patients with metabolic acidosis presents with dyspnoea and air hunger. Patients with Diabetic Ketoacidosis have been wrongly evaluated for respiratory conditions.

FPs often encounters patients with abnormal respiratory sounds audible at bedside or on auscultation. This may trigger an immediate reflex action of ordering a beta2 agonist nebulisation to relieve bronchospasm. Partial and non responders are often referred to EDs. Infrequently, EDs have picked out such patients who does not have bronchospasm but stridor from upper airway obstruction. Stridor is an abnormal inspiratory sound produced by partially occluded upper airway (ranging from ingested foreign body to infective causes e.g. acute epiglottitis). It is imperative for FPs to recognise during which phase of respiration the abnormal audible respiratory noise is heard. Bronchospasm produce rhonchi and audible wheeze which is heard during the expiratory phase of breathing. Mistaking stridor for a wheeze can delay diagnosis of acute life threatening upper airway obstruction and emergent treatment required.

Handheld pulse oximeters are now widely available and are becoming indispensable in the initial evaluation of the breathless patient. It tells us how well our patient’s blood is saturated with oxygen. Low oxygen saturation generally requires immediate administration of supplemental oxygen. However, the number on the pulse oximeter merely informs us of the oxygen saturation but not the carbon dioxide level. Breathless patients on supplemental oxygen with normal oxygen saturation can still hypercapnic and this is a sign of potential need for non-invasive or mechanical ventilation. Table 2 summarises some pitfalls in the acutely breathless patient.

TABLE 2. PITFALLS IN PATIENTS PRESENTING WITH ACUTE SHORTNESS OF BREATH

1. Anxiety and other psychiatric conditions should only be considered as the diagnosis after careful exclusion of other life threatening causes
2. Not considering non pulmonary/cardiac causes such as metabolic acidosis
3. Mistaking stridor for wheezing
4. Not including PE as a possible diagnosis
5. Thinking that normal pulse oximeter reading excludes respiratory failure.

THE PATIENT WITH HEADACHES

Headache is one of the commonest presentations that FPs need to deal with. It is well recognised that patients with unremitting severe headaches with other accompanying history such as vomiting, altered mental status, abnormal neurological symptoms and signs mandate further evaluation including advanced imaging in many such cases. After exclusion of intracranial haemorrhage, meningitis/encephalitis and brain mass lesion, the majority of remaining cases generally have more “benign” causes and course.

Subarachnoid Haemorrhage (SAH) is often described as acute sudden onset of worse ever headache of their life, thunder clasp in nature. The key to diagnosis is to get a good history of the onset of the headache. SAH can also present in many other ways as altered mental status such as confusion, syncope. Any change in mental status from their premorbid status must include SAH as part of FP’s differential diagnosis.

Meningitis and Encephalitis presenting with headache are life threatening emergencies not to be missed in our practice. The classic triad of fever, neck stiffness and altered mental status may not be present in all patients. Diagnosis often required a high index of suspicion and confirmed only by examination of spinal fluid obtained through a lumbar puncture.

Another oft encountered clinical situation by FP is headache in the patient with elevated blood pressure. It is common belief that headache is related to elevated blood pressure. Whether it is the headache that causes the elevated pressure or vice versa is debatable. Data from ED patients in USA did not find any correlation between elevated BP and headaches². In fact, thinking that a patient’s headache is due to elevated BP may result in one missing on serious causes (e.g. SAH, spontaneous subdural haemorrhage). Any change in the usual headache pattern, presence of new associated symptoms, or new onset in elderly should make FP consider referring the patient for advance imaging of the brain. Table 3 list some pitfalls in patients presenting with headaches.

TABLE 3. PITFALLS IN PATIENTS WITH HEADACHES

1. Not considering need for advanced imaging for patients with possible diagnosis of intracranial haemorrhage, meningitis/encephalitis and brain mass lesion
2. Dependent on the classical triad of fever, neck stiffness and altered mental status to diagnose meningitis/encephalitis
3. Considering headache as a consequence of elevated blood pressure
4. Not considering a more sinister cause in the following patients:
 - a. New onset headache in elderly
 - b. Change in headache pattern
 - c. New associated symptoms e.g. visual change
5. Failure to consider other “non cranial” causes of headaches:
 - a. Acute angle closure glaucoma
 - b. Temporal arteritis
 - c. Pregnancy related complications e.g. pre-eclampsia

THE PATIENT WITH ABDOMINAL PAIN

As medical students and physicians, we have been taught that in 90% of our patients a good clinical history and physical examination will be sufficient to clinch the diagnosis. Even in the era of readily available advanced laboratory and imaging technology, the mind and skills of the learned FP is vital in deciding appropriate disposition and management. However, there are several potential pitfalls which FP must be cognizant of to ensure optimal outcome for their patients.

The elderly patient presenting with acute abdominal pain can present a challenge to any physician for a variety of reasons. At the ED, elderly patients with abdominal pain should have a ECG to exclude possibility of ACS which may present as abdominal pain instead of typical chest pain. Those with acute sudden onset are often given higher priority for evaluation as there are many life threatening causes that require exclusion such as perforated ulcers, mesenteric ischemia, rupture hepatoma, leaking abdominal aortic aneurysm, strangulated hernia, etc. The physical examination (apart from abdominal examination) should include looking for jaundice/pallor, cardiac examination for pulses, arrhythmia (such as atrial fibrillation), murmurs and heart failure (low flow state), trunk and back for rashes (e.g. lesions of herpes zoster), hernia orifices and a per rectal examination.

In general, the elderly patient presenting with acute abdominal pain will require FPs to maintain a high index of suspicion for potential life threatening causes. The varied and atypical presentation makes this a challenging clinical encounter. Very often, serial reviews with physical examination with use of laboratory testing and imaging may help in elucidating the cause. Table 4 list some pitfalls in the evaluation of patients with acute abdominal pain

TABLE 4. PITFALLS IN PATIENTS WITH ACUTE ABDOMINAL PAIN

1. Not recognising that elderly patients generally presents atypically compared to younger patients with the same cause for their pain.
2. Lack of clinical signs on abdominal examination does not exclude potential life threats e.g. mesenteric ischemia.
3. Failure to recognise that low flow states (such as heart failure), and arrhythmias (such as atrial fibrillation) can produce mesenteric ischemia
4. Not excluding pregnancy and its related complication as a possible cause in females of reproductive age group.
5. Not considering possibility of ACS in elderly patients.

BACK PAIN

Patients with acute and chronic non traumatic back pain often presents to primary care and EDs for evaluation and relief of symptoms. Although most of such patients only require rest, analgesia and other conservative measures, there are some who have life threatening causes masquerading as the musculoskeletal back pain.

Upper back pain can be the first symptoms of ACS (e.g. posterior infarction) and Aortic Dissection (AD). Typically

AD presents with tearing chest pain which radiates to the back. Leaking abdominal aortic aneurysm (AAA) may also present with low back pain. Therefore, particularly in the elderly, presentation with back pain require more than physical examination of the back and neurological status of the spine and lower limbs. AD can present with a myriad of other clinical symptoms and signs depending on extent of the dissection.

Back pain with sciatica and radiculopathy (sensory symptoms and pain) is a bothersome condition for most but can often be managed conservatively with physical therapy and pain control. However, the presence of myelopathy and signs of cord compression mandate more urgent evaluation as treatment can be time sensitive (e.g. cord compression from tumours). The evaluation of the spinal cord for compression is required for all cases with back pain (such as sensory level, weakness, saddle anaesthesia, loss of anal tone, bladder emptying, etc.) Table 5 list some potential pitfalls in evaluation of back pain

TABLE 5. POTENTIAL PITFALLS IN EVALUATION OF BACK PAIN

1. Not considering ACS, AD and AAA as possible causes
2. Failure to perform a full neurological examination to look for spinal cord compression
3. Overuse of plain x-rays for evaluation of non-traumatic back pain (providing false reassurance).

WOUND AND INJURIES

Every FP will in their professional practice encounter patients with injuries and wounds. Those who sustained severe multiple injuries are generally evacuated to EDs of RHs for management. Compared to many other primary care medical conditions, the injured patient generally takes a little more time to be evaluated and treated as this may involve wound care and other clinic based interventions.

Following injury, it is imperative for FP to find out what caused the injury. For example, did the patient experience a syncopal episode? Was it related to alcohol intoxication? Did any bystander notice any seizure activity? Often the injury dominates the attention of the FP and the cause may not be appreciated. The mechanism and the consequence of injury were being sought after. Patients on antiplatelet, antithrombotic and, in particular anticoagulants, e.g. warfarin are at increased risk of bleeding. Internal bleeding (e.g. head, chest and abdomen) must be suspected if these compartments are injured.

One area of recurring contention is the management of wounds with foreign bodies e.g. glass fragments. This can arise from workplace, domestic and violence. It is known that detection of foreign body (FB) e.g. glass is unreliable by physical examination. If there is history of involvement of glass fragment and there is presence of sensation of FB in the wound, it is imperative that wound exploration be done. If no FB is found, x rays can be used to look for any retained FB. X-rays are generally useful for detecting radiopaque FBs (note that not

all glass fragments are radiopaque). It is prudent to inform the patient of possibility of retained foreign body and seek medical attention as appropriate.

Certain wounds are at risk for increased morbidity compared to others (see Table 6). Regardless of risk, all wounds are to be treated with thorough cleansing, exploration (if possible) and wound dressing or closure (as appropriate). Bites from mammals (e.g. dogs and cats) are likely to increase with popularity of domestic pets. Human bites (e.g. fight bite – deep laceration with involvement of MCP joint/s of the hand from patient throwing a punch to the opponent's mouth/teeth) are prone to most prone to infection followed by cat and dog bites in decreasing frequency³. It is prudent to assess mammalian bite wounds based on wound and patient characteristics to determine the risk and need for prophylactic antibiotics. High risk wound characteristics include – puncture wounds, deep involving underlying structures, crushing with devitalising wounds. Patients who are immune compromised (e.g. diabetes); surgical implants and prosthesis are at increased risk. Table 6 list some common pitfalls when evaluating and managing wounds in ambulatory setting.

TABLE 6. COMMON PITFALLS WHEN EVALUATING AND MANAGING INJURIES AND WOUNDS IN AMBULATORY SETTING

1. Failure to determine the medical condition that may have resulted in the patient's injury
2. Distraction by concern for overt external injury and failure to recognise undetected internal injury
3. Failure to recognise the increased morbidity and mortality for patients on anticoagulants following blunt head and torso injuries.
4. Retained FB (e.g. glass) in wounds are a common cause of patient dissatisfaction
5. Wound closure may be technically appealing but wound toilet and exploration is key to wound care and prevention of infection.
6. Patient characteristics and risk profile is as important as wound profile for proper management.

THE PREGNANT PATIENT

The presence of a foetus is an additional burden that FPs have to deal with in a pregnant female patient. There is usually a heightened sense of concern and index of suspicion whenever a pregnant patient presents to the clinic or the ED with any clinical complaints. It is well known that there are anatomical changes which make the pregnant patient presenting with abdominal pain more difficult to assess. The enlarging gravid uterus rising from pelvis splints and limits diaphragm movement making breathing in some patients a more conscious activity compared to totally subconscious activity for normal persons.

Dyspnoea is a relatively common symptom in pregnant patients particularly in the third trimester. In general, dyspnoea should be a gradual onset and may worsen as pregnancy progresses. However, acute onset of dyspnoea must be taken seriously and possible differential diagnosis considered. Peripartum Cardiomyopathy (PPCM) and pulmonary embolism

(PE) are possible causes. PPCM presents with clinical symptoms and signs of congestive heart failure usually in the third trimester or in the early post-partum period. Unfortunately, features such as dyspnoea, fatigue, orthopnoea and pedal edema suggestive of cardiac failure are also commonly found in normal third trimester patients. Pregnancy results in a hypercoagulable state and increases the risk of venous thromboembolism such as PE. Diagnosis of PE in a non-pregnant patient is clinically challenging. Patients with low pre-test probability can have PE ruled out if their d-dimer test is negative. However, pregnant patients are considered to have a moderate pre-test probability and there is no role of d-dimer in the diagnostic workup. If PE is suspected, then it is prudent to refer them to ED for CT pulmonary angiogram or other investigations.

Pregnant patients who present following blunt thoracic and abdominal injury require the assessment with principles advocated by BTLS and ATLS. A stable patient however does not mean that the foetus is not in any distress. Placenta abruption is the commonest cause of foetus loss following blunt abdominal injury in pregnancy. Classical triad of abdominal pain, tenderness and vaginal bleeding has been used to identify patients who may have abruption. However, in a small proportion of patients, the classic triad may not be present. The only way to detect this is to monitor the foetus for distress which requires cardiotocographic monitoring (CTG). Table 7 lists potential pitfalls in managing a pregnant patient

TABLE 7. POTENTIAL PITFALLS IN MANAGING A PREGNANT PATIENT

1. Not realising that anatomical and physiological changes in pregnancy can result in atypical presentation of common clinical entities.
2. Assuming that dyspnoea (particularly of acute onset) is due to growing size of the gravid uterus
3. Attributing the signs of heart failure to that of normal third trimester of pregnancy
4. Not including diagnosis of PE in the differential diagnosis of acute medical complaints
5. Fetal monitoring is important to exclude complications following blunt maternal thoraco-abdominal injury.

CONCLUSIONS

Majority of the patients in your family medicine practice will present with common clinical problems which can be evaluated, investigated and treated in the clinic/office setting. Many of whom may be patients who have chronic medical problems (such as hypertension, diabetes etc.) which you have been providing long term care and follow up. However, when they do seek attention with other acute emergent issues, the FP has to decide who and which problem requires further evaluation and treatment. Some of whom may require referral to EDs or SOC. The learning points presented can help FPs identify areas where potential pitfalls in patient management could occur.

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LEARNING POINTS

- **Not all patients with ACS presents with chest pains (beware of patients presenting with syncope, diaphoresis, dyspnoea, pain upper back, etc.)**
- **In a breathless patient, anxiety and other psychiatric conditions should only be considered as the diagnosis after careful exclusion of other life threatening causes: metabolic acidosis, partially occluded upper airway, bronchospasm, and pulmonary embolism.**
- **In a patient with headaches, intracranial haemorrhage, meningitis/encephalitis, and brain mass lesion need to be considered in the differential diagnosis.**
- **The elderly patient presenting with acute abdominal pain will require FPs to maintain a high index of suspicion for potential life threatening causes.**
- **Possible causes of serious backache are ACS, AD, AAA, and spinal cord compression.**
- **In the wounded patient, there is a need to determine the medical condition that may have resulted in the patient's injury, and patient's risk profile is as important as the wound profile for correct management.**
- **In the pregnant patient, dyspnea can be due to pulmonary embolism, or heart failure; placenta abruption from abdominal injury may not have the classical triad of pain, tenderness or vaginal bleeding.**