

Clinical Assessment of the Older Breathless Patient

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INTRODUCTION

It should not be construed as unusual to discuss breathlessness in an older patient presenting to a Zambian health institution today. Our Millennium Development Goals (MDGs) include eradication of poverty and hunger and decreasing childhood mortality by 2015 (1). If achieved, a safe assumption is that there will be more people surviving into adulthood thus increasing the older age group. Approximately 2.4% of our 10 million population are 65 years and over (2). If this age group had complex comorbidities, the appropriate specialist care would be provided by a multidisciplinary team lead by a Geriatrician. It is therefore harmless to learn about how to look after these millennium survivors when they present with common medical symptoms. One of these symptoms is breathlessness or dyspnoea. The American Thoracic Society in 2003 defined dyspnoea as “a subjective experience of breathing discomfort that consists of qualitatively distinct sensations that vary in intensity”. The nomenclature is fluid.

The summary article below is intended to be a reminder of an organised bedside clinical approach to assessing a patient with this common symptom. The epidemiology of this symptom in the Zambian health sector is unknown. It would be difficult to quantify. Also, it's not clearly known what the accurate equivalent vernacular descriptions are for dyspnoea. This should not preclude the need for one to have the knowledge to rapidly assess a potentially serious underlying respiratory or cardiovascular disease. I will use breathlessness and dyspnoea interchangeably.

AGE-RELATED CHANGES AND PATHOLOGY OF DYSPNOEA

The physiological function of the cardiovascular and respiratory system is not part of this summary. A simplified aide-memoir of age-related changes is shown in figure 1 below (3). Some examples of disease susceptibility due to these changes are also given. Included also are senescent changes in the vascular system of the central nervous system that result in cognitive impairment. This would affect the accuracy of history taking during clinical assessment.

The perception of dyspnoea is due to a complex interaction of variable receptors. These include chemoreceptors, mechanoreceptors and lung receptors working in concert to detect hypoxia, hypercapnia, sense of irritation and inflammation (4). With increased age, the muscles of the rib cage including the diaphragm lose their mass but increase fat which impairs the work of breathing. Calcific degeneration of the costal cartilages in arthritis as well as kyphoscoliosis diminishes chest wall compliance and recoil (4). The overall precise mechanisms of dyspnoea remain unclear but a conceptual approach would be to presume presence of a reflex arc involving the vagus nerve, brain stem and cerebral cortex. This would include a receptor from which an afferent impulse is generated, this in turn being integrated in the intact central nervous system thus creating an efferent signal to invoke the sensation of dyspnoea (5). The pathophysiology of dyspnoea may differ according to aetiology (6).

SYSTEM	PARAMETER AFFECTED	DISEASE EXAMPLE
Respiratory		
	Vital capacity↓; Oxygen diffusion ↓	Chest Infections
	Lung tissue fibrosis and dysplasia	Malignancy, Emphysema
	Chest wall rigidity and kyphoscoliosis	Osteoporosis; Congenital
Cardiovascular		
	↓ Elasticity of aorta, arteriosclerosis	Isolated Systolic Hypertension, Heart failure, Ischaemic Heart Disease
	Valvular degeneration	Bundle branch block, Aortic stenosis
	Myocardial tissue fibrosis	Arrhythmias, Heart failure
Central Nervous System		
	Arteriosclerosis; Hyaline changes	Vascular dementia

Figure 1-Examples using ref (3) of age-related pathologies in the cardiorespiratory and central nervous systems, showing some disease susceptibilities to the changes.

CLINICAL ASSESSMENT

Although in theory the pathophysiology of dyspnoea may differ according to aetiology, the initial bedside approach to the acutely unwell breathless older patient is similar. The patient with complex comorbidities is more likely to have several aetiologies. The older the patient, the more likely they are to have more differentials acting together. The astute clinician would prioritise which disease is dominant at the time of assessment. The same is also true of the assessment in an outpatient clinic setting. I do not intend to discuss the details of each differential diagnosis of the more than 30 likely causes of dyspnoea. However, I have outlined below an accepted approach that I find useful under any pressure environment.

At the bedside, below are nine points adapted from reference 7 which are useful under a pressurised environment of an acute life threatening episode of severe dyspnoea:

- Prop up the patient to help recruit good respiratory excursion
- Ensure patient has an intact airway, is breathing spontaneously and has a cardiac output. An absent airway excursion rapidly kills the patient way before a compromised breathing or spontaneous circulation stops producing an output. Hence the useful ABC acronym. Measure the oxygen saturation and give high flow oxygen.
- Whatever the clinical experience, always call for help to maximise patient care.
- Carry out a primary examination of the patient assessing the temperature, pulse, respiratory rate (usually ignored) and blood pressure.
- Following the above, emergency treatment is started ensuring intravenous access, need to give nebulised bronchodilators or intravenous diuretics.
- After the initial basic assessment, arrange simple investigations like an electrocardiogram (ECG), chest X-Ray, a full blood count, urea, sodium, potassium, calcium, glucose, arterial blood gases and cardiac damage biomarkers.
- Take a focussed brief history asking for chest pain, trauma, hypertension, diabetes mellitus, previous similar episodes or recent fever would help find and treat the cause. Do the secondary examination as the continuum of physical examination.

- Although a taboo subject for the Zambian environment, consider whether cardiopulmonary resuscitation is indicated.
- Continuously assume that all the above are incomplete!

Using the above bedside approach, common causes of severe acute dyspnoea in any environment would be appropriately managed pending more specific secondary diagnostic tests or precise management. Some differentials are given below:

PULMONARY CAUSES-

- Pneumonia- fever, cough, haemoptysis, pleuritic chest pain, bronchial breathing
- Asthma- paroxysmal cough, wheeze, copious viscid sputum, atopic history
- Chronic Obstruction Pulmonary Disease (COPD)- as in asthma but also chronic smoker, occupational lung disease
- Pneumothorax- recurrent faller, recent chest trauma, poor response to asthma or COPD treatment (check the chest X-ray)
- Carcinoma of lung with or without malignant pleural effusion- above in a cachexic patient (check the chest X-ray)
- Pulmonary Embolism- recent long-haul flight in "Bana Makwebo" business persons

CARDIOVASCULAR CAUSES-

- Cardiac Failure- acute or acute-on-chronic-orthopnoea, nocturnal cough, nocturia, a chest X-ray and an echocardiogram are essential.
- Cardiac Arrhythmias- fast atrial fibrillation, ventricular tachycardia (need ECG)
- Myocardial Infarction- central cardiac chest pain, hypertensive diabetic, read the ECG and do cardiac biomarkers.
- Aortic Dissection- central chest pain radiating to the interscapular area and markedly different blood pressures in both arms. Needs echocardiogram or computerised tomography scan for accurate diagnosis.
- Pericardial Tamponade- Tuberculosis, Kaposi's sarcoma, trauma, recent pericarditis. Will need an echocardiogram to confirm diagnosis.

EXTRA-PULMONARY AND/OR EXTRA-CARDIAC CAUSES-

- Diabetic Ketoacidosis- high blood glucose with severe acidosis. Treat the precipitating causes whilst correcting the metabolic impairment with saline, insulin and potassium (SIP)
- Severe Sepsis Syndrome- leucocytosis, high inflammatory response markers, shock. Do blood cultures to confirm organism and hence manage correctly.
- Acute Drug Allergy/Anaphylaxis- take careful history and remove offending allergen
- Brain-stem stroke- careful history and examination
- Neuromuscular dysfunction- Post-infective ascending polyneuropathy
- Hyperventilation and Anxiety- similar previous history, normal investigations except respiratory alkalosis.

Almost all the above can cause sudden acute breathlessness occurring within one hour.

In the outpatient clinic setting, there is relatively more time to take a careful history, do a complete physical examination and send patient for ancillary investigations. Although there are many specific aetiologies that cause breathlessness, a simplified way would be to divide them into broadly four categories. These are Cardiac, Respiratory, Anaemia and Psychoneurological. A symptom complex developing over an hour should not normally present to an outpatient clinic. The approach to these has been outlined above.

Evaluation of breathlessness developing over weeks or months must include assessment for heart failure, anaemia, pleural effusion, pulmonary fibrosis, bronchial malignancy and weight gain causing a high body mass index. A wealthy older patient is not excluded from the gains of an environment nurture that facilitates this body habitus. Breathlessness over months and years would be caused by COPD, occupational lung disease (e.g. pneumoconiosis), pulmonary hypertension, old tuberculous fibrosis and musculoskeletal problems like kyphoscoliosis, ankylosing spondylitis and osteoarthritis. Be wary of the patient with dyspnoea and normal ancillary investigations like a chest X-ray. A chest X-ray squeezes all its information onto one flat piece of film in an attempt to show a three-dimensional chest structure. This test may therefore need to be supplemented by the same tests stated in the above patient with acute life-threatening dyspnoea.

A history of dyspnoea should assess the following:

- Onset of symptoms- days, weeks or months
- Descriptive qualities including exercise tolerance, posture association where dyspnoea in the lateral position is trepopnoea, as in pleural disease; orthopnoea occurs in the supine posture classic example being left ventricular failure; and platypnoea is dyspnoea in erect posture, relieved by lying supine such as new manifestation of atrial septal defect due to sudden rise in pulmonary vascular pressure (8).
- Frequency of symptoms and any paroxysmal qualities
- Severity or intensity
- Duration
- Triggers of the problem
- Activities that provoke the symptom
- Associated symptoms such as fever, weight loss or anorexia
- Alleviation factors like medications or allergens

CONCLUSION

I have outlined what should be a simple bedside and outpatient approach to the older patient presenting with breathlessness due to a cause from one of four broad categories viz cardiac, respiratory, anaemia or psychoneurological. I thought discussing the intricacies of each diagnosis would defeat the theme of a bedside or out-patient clinical assessment. An inquisitive clinician should endeavour to have and do diagnostic tests that confirm the clinical suspicion. The plethora of differential diagnoses of causes of breathlessness and their severity can only be teased out by excellent clinical acumen. This symptom should never be ascribed to the ageing process *per se*; **there is always a background cause.**

Despite the current Zambian population demographics, improving the clinical care of the relatively older patient must be acknowledged. The emphasis at present is understandably maximising resources on communicable syndromes of HIV/AIDS, tuberculosis, malaria and diarrhoeal diseases. Its now well documented that HIV/AIDS is the grandmother's disease because of their social input in caring for orphaned grandchildren (9). Who will give ideal clinical care to these grandmothers when they have dyspnoea syndromes from cardiorespiratory diseases. The older patient also deserves a healthcare resource that evaluates ill-health by taking a careful history, doing a thorough physical examination and confirming the diagnosis using appropriate ancillary tests that inform modern management.

Conflict of Interest- No conflict of interest

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