

CREPITATIONS

Prof DS Rossouw, MBChB, MMed(Int), D Phil

Prof J H Retief, MBChB, MMed(Int), MSc(Clin Epid)

Department of Internal Medicine, Kalafong Hospital, Faculty of Health Sciences, University of Pretoria

Correspondence to authors: jhretief@kalafong.up.ac.za

Contributions to this column: E-mail: douw@medpharm.co.za, Fax (012) 664 6276 or P.O. Box 14804, Lyttelton Manor 0157.

This column is aimed at developing your clinical acumen. A clinical quiz will alternate with a short discussion of a clinical sign. You are invited to send us requests for future topics and to provide photographs of clinical signs for the quiz section. Kindly send a fax or e-mail with your requests and mail high gloss photographs or a disk with high resolution (300dpi) jpeg files to us. (See contact details above) Photographs may include clinical signs, photographs of poisonous insects, plants, snakes, contaminated water or anything that may cause sickness or disease in South Africa. Kindly provide a short clinical synopsis of 100-200 words from which a quiz can be formulated.

1. INTRODUCTION

With the availability of highly technological innovations to the medical profession, e.g. Radiological imaging, Computer tomography and other related developments, the question is often asked how relevant and important can a clinical investigative procedure, for example auscultation of the lungs, still be? If crepitations are found on auscultation of the lungs, should only x-rays be taken before deciding if "antibiotics or diuretics" are necessary? And, how sensitive or specific is the finding thereof for the clinician? No studies were found in a Medline search from 1966-2004, indicating the specificity or sensitivity of crepitations in diagnosing any specific clinical condition.

2. CLASSIFICATION

2.1 FINE CREPITATIONS:

Origin: From the Latin "crepitare": to crackle. An adventitious sound and not an essential part of the respiratory cycle. It is an interrupted sound. Fine crackles on auscultation of the lungs are associated with only three basic lung conditions:

1. **Fluid** in the bronchioli or ALVEOLI, due to congestion of the pulmonary vasculature. Examples: Left heart failure, mitral stenosis, other causes of pulmonary oedema.
2. **Infection** that involves the ALVEOLI. Examples: Lobar pneumonia, broncho pneumonia or bronchiectasis. In all cases it implies infected exudates in the alveoli.
3. **Lung fibrosis**, involving the ALVEOLI.

From this short list one can gather that fine crepitations mean alveolar involvement. To differentiate between the different etiologies may be difficult, however, the accompanying symptoms and signs may be of great help.

1. Bilateral basal crackles that diminish higher up are most likely to be due to congestion.
2. The patient will most likely suffer from orthopnoea and/or paroxysmal nocturnal dyspnoea (PND).
3. There may be other signs of heart failure like cardiomegaly, tachycardia, a third heart sound and even signs of concomitant right heart failure.
4. If the congestion is severe, it may give rise to unilateral or bilateral pleural effusions. No breath sounds will then be audible at the lung bases, BUT the crepitations will be prominent at the upper borders of the effusions. As one auscultates higher up the crackles will diminish.
5. In advanced pulmonary congestion some of the fluid will

overflow into the bronchial tree. This will cause coarse crackles (wet ronchi, rales) to be heard in addition. (See later for more detail.)

6. Fine crackles caused by infection are often accompanied by fever and expectoration of purulent sputum. If it is associated with consolidation like in lobar pneumonia, one can expect the classic signs like bronchial breathing, increased vocal resonance, vocal fremitus, dullness to percussion and decreased air entry. The signs are usually limited to one or more lobes only.
7. The fine crackles associated with lung fibrosis sound different: Bronchial breathing, vocal fremitus and vocal resonance may be very distinct. The crepitations sound louder than in other pathology. They sound very close to the stethoscope and can be compared to the sound when Velcro® strips are separated. They are also sometimes described as "metallic" in character.

2.2 COARSE CREPITATIONS

Synonyms are moist rales or moist ronchi. This means overflow of fluid from the alveoli into the bronchi. It may be purulent or watery. What one hears is inspired air bubbling through the fluid. Logically they can be heard both on inspiration and in expiration. They often disappear (temporarily) on coughing, implicating less structural changes in the lungs or bronchi.

2.3 CREPITUS

This is heard in surgical emphysema. In most cases it is caused by air leaking from the respiratory tract into the interstitial space. It is easily palpated and feels like cracking eggshells. It has a very sharp crackling sound on auscultation due to the close proximity to the stethoscope. Infection by gas forming organisms is a rare cause of crepitus.

CONCLUSION

The rural doctor, armed with a stethoscope, should be able to detect crepitations, implicating alveolar involvement. Whether "antibiotics or diuretics" will be prescribed is determined by accompanying symptoms and signs. An x-ray may not be necessary if other signs clearly support the diagnosis, but in certain cases a thorough workup may be necessary.

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