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Cardiac chest pain: does body language help the diagnosis?

W M Edmondstone

The pain of cardiac ischaemia is characteristically crushing, gripping, or tight in nature. When describing their chest pain many patients will use movements of the hands to illustrate their symptoms. A clenched fist to the centre of the sternum conveys the gripping quality of the pain (Levine's sign; fig 1) while a flat hand describes the sensation of crushing heaviness (fig 2).¹ Tight band-like chest pain may be represented by a movement of the palmar surfaces of both hands laterally from the centre of the chest (fig 3). Patients with non-cardiac pain may use other actions to illustrate their pain, such as movement of the fingertips up and down the sternum (oesophageal pain) or pointing to one spot (chest wall pain).

In response to the request "show me where your pain is and tell me what it feels like" virtually all the patients I have seen used their hands not only to show the location of the pain but also to convey its quality. It is often assumed that Levine's sign and its variants are good markers for ischaemic cardiac pain but their value has not been assessed objectively. This study aimed to measure the sensitivity, specificity, and predictive value of these signs in patients admitted to the coronary care unit with chest pain.

Patients, methods, and results

During their initial clerking patients admitted to the coronary care unit with chest pain were asked to "show

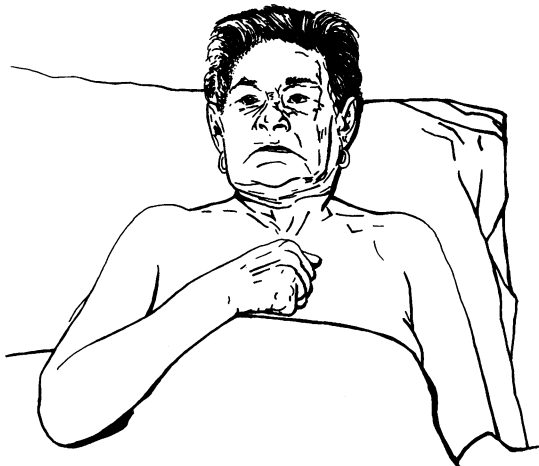


Fig 1—Levine's sign: clenched fist to middle of chest



Fig 2—Flat of hand to centre of chest



Fig 3—Both hands placed flat in middle of chest and drawn outwards

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Hand movements made by patients in response to a request to "show me where your pain is and tell me what it feels like"

Diagnosis	Clenched fist to centre of chest	Flat hand to centre of chest	Palms drawn laterally from centre of chest	Others
Cardiac (n=138)	19	64	27	28
Non-cardiac (n=21)	4	4	2	11
Uncertain (n=44)	3	13	7	21

me where your pain is and tell me what it feels like." The admitting doctor recorded the response on an illustrated form, choosing from three designated responses (clenched fist to the centre of the sternum; flat hand to the centre of the sternum; both flat hands drawn from the centre of the chest outwards) or describing some other action and drawing it on the form. The forms were collated and stored for at least one year after admission to allow time for any investigations such as exercise electrocardiography, cardiac perfusion scanning, coronary angiography, and upper gastrointestinal endoscopy to be completed. The forms were kept by an independent observer while the case notes were examined without knowledge of each patient's chest pain response. Each case was classified as cardiac, non-cardiac, or uncertain. When all the notes had been examined the final clinical classification for each was matched to the original chest pain response.

The notes of 203 consecutive patients admitted during a six month period in 1992-3 were examined. The cause of the chest pain was considered to be

cardiac in 138 (68%), non-cardiac in 21, and uncertain in 44 (most of these patients had coexisting cardiac ischaemia and gastro-oesophageal disease). Of the patients with cardiac pain, 110 (80%) used the designated hand movements to describe their pain, but only 33 (51%) of those with non-cardiac or pain of uncertain origin did so ($\chi^2=17.8$, $P<0.01$). Only 19 (14%) patients with cardiac pain displayed the true Levine's sign compared with 64 (46%) who placed the flat of the hand on their chest while describing their pain and 27 (20%) who drew both hands outwards (table).

Although the sensitivity of the designated hand movements for cardiac pain was high (80%), the specificity was low (49%). This gave a positive predictive value of 77% and a negative predictive value of 53%.

Comment

This study has shown that if patients admitted to a coronary care unit illustrate the nature of their chest pain by placing a clenched fist or a flat hand on the sternum, or by drawing both palms laterally across their chest, there is a 77% chance that their pain is due to cardiac ischaemia. If they do not use these signs there is an even chance that their pain is non-ischaemic. These signs are not discriminatory, but a positive response lends support to a diagnosis of cardiac ischaemia.

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Frostbite of the face and ears: epidemiological study of risk factors in Finnish conscripts

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Abstract

Objective—To determine the incidence of and the risk factors for local cold injuries of the face and ears in peacetime military service.

Design—Prospective, controlled epidemiological study using a questionnaire.

Setting—Finnish defence forces, 1976-89.

Subjects—913 young male conscripts with local frostbite of the head that needed medical attention and 2478 uninjured control conscripts.

Main outcome measures—Type of activity, clothing, and other risk factors at the time of cold injury. Odds ratios were used to calculate risk. Controls were handled as one group.

Results—The mean annual incidence of frostbite was 1.8 per 1000 conscripts. Frostbite of the ear was most common (533 conscripts (58%)), followed by frostbite of the nose (197 (22%)) and of the cheeks and other regions of the face (183 (20%)). Most conscripts (803 (88%)) had mild or superficial frostbite. Risk factors included not wearing a hat with earflaps (odds ratio 18.5 for frostbite of the ear); not wearing a scarf (odds ratio 2.1 and 3.8 for frostbite of the ear and cheeks respectively); using protective ointments (odds ratio 3.3, 4.5, and 5.6 for frostbite of the cheeks, ear, and nose respectively); being extremely sensitive to cold and having hands and feet that sweat profusely (odds ratio 3.5 for frostbite of

the nose); and being transported in the open or in open vehicles under windy conditions (odds ratio 2.2 for frostbite of the cheek).

Conclusions—Wearing warm clothing, including a scarf and a hat with earflaps, helps to prevent frostbite. Each person's sensitivity to cold may also be important. The routine use of protective ointments should not be recommended.

Introduction

Local cold injuries are a common problem of military operations and training in wintertime, especially during land manoeuvres.^{1,2} Feet and hands are most prone to cold injuries, but the unprotected areas of the head—ears, nose, and cheeks—are also vulnerable to cold.³

In addition to the ambient temperature, other factors influence the risk of developing frostbite of the face and ears. The wind (windchill effect) greatly affects heat loss from the skin by convection.^{4,5} Preventive behaviour and protective clothing diminish the risk.^{6,7} Protective ointments are traditionally used,⁸ but their role is controversial.⁹

Exposure to cold is part of outdoor training for the Finnish defence forces in winter, both at garrisons and during manoeuvres. We evaluated the incidence of and risk factors for frostbite of the face and ear in Finnish conscripts during military service.