

Weakness as presenting symptom in the emergency department

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Background

Weakness is a common presenting symptom in patients in the emergency department (ED), and is an obvious challenge to ED physicians. However, very little research has been undertaken to elucidate the causes and outcome of this complaint.

Methods

This observational, prospective study of consecutive patients with a presenting symptom of weakness was conducted at the ED of Basel University Hospital, Switzerland. Over a 4-week period all non-trauma patients (aged 18 years and over) subsequently admitted to the hospital were screened for inclusion. Trained ED nurses registered the presenting symptoms of all new patients with an emergency severity index (ESI) of 1–3. Patients were included if weakness was recorded by the ED nurse and the patient complained of either localised or generalised weakness within the first 3 sentences of the history as taken by the ED physician. The final diagnosis was determined by an expert panel of at least two board-certified internal medicine specialists after chart reviews in all cases. Diagnoses were classified according to World Health Organization (WHO) ICD-10 [4].

Results

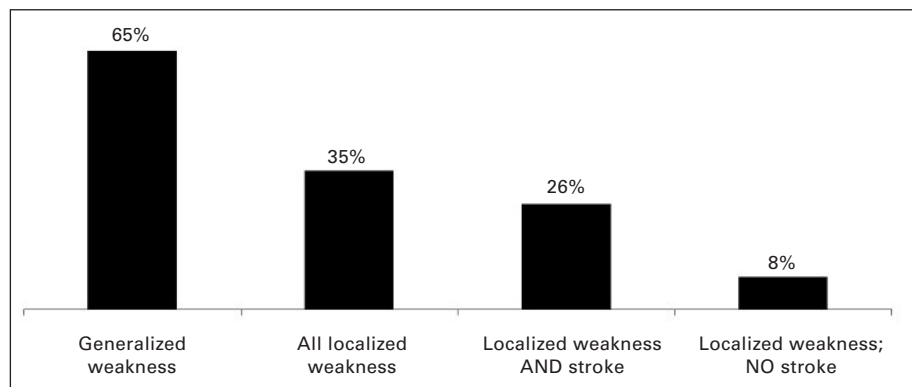
From February 7 2007 to March 7 2007 a total of 3152 patients presented to the ED. 935 patients with an emergency severity index (ESI) of 1–3 were admitted. 615 were non-trauma patients. Of these, 121 patients with the complaint of weakness were identified. 60% of the patients were women and 40% men. Median age was 78 years (range: 24–98).

65% of the patients complained of *generalised weakness* and 35% of *localised weakness*. Of the patients presenting with *localised weakness*, 76% had a final diagnosis of either TIA, cerebral ischaemia or intracerebral haemorrhage. The remaining 24% with *localised weakness* were diagnosed with “stroke mimics” [1] such as migraine, Todd’s paralysis, intoxication, or radicular symptoms. In one patient with *localised weakness* we diagnosed Miller Fisher syndrome. In another patient with *localised weakness* we found severe hypokalaemia.

In patients presenting with *generalised weakness* the spectrum of diagnoses was widely spread throughout 14 diagnostic cate-

Figure 1

Spectrum of 121 consecutive patients admitted to the ED with weakness.



gories according to the ICD-10 (see fig. 2). The largest group were infections (total n = 25, 32%): respiratory tract infections (n = 14, 18%) with pneumonia (n = 8), flu-like symptoms (n = 4), bronchitis (n = 2) and other infections (n = 11, 14%) such as gastroenteritis (n = 4), urinary tract infections (n = 1), cholecystitis (n = 1), erysipelas (n = 1), pericarditis (n = 1), HIV CDC 3 (n = 1) and 2 infections of unknown origin. The second largest group were metabolic dysfunctions (n = 14, 18%): acute renal failure (n = 4), severe dehydration (n = 4), hyponatraemia (n = 2), hypokalaemia (n = 1), metabolic acidosis (n = 1), newly diagnosed diabetes mellitus II (n = 1), and Addison’s disease (n = 1). The third largest group were malignancies (n = 8, 10%): 6 patients with previously known malignancy and 2 with newly diagnosed malignancies (non-small cell lung cancer (n = 1), acute myeloid

leukaemia (n = 1)). Non-somatic causes of weakness comprised 8 patients (10%): functional conditions (n = 3), frailty (n = 3), dementia (n = 1) and depression (n = 1).

Discussion

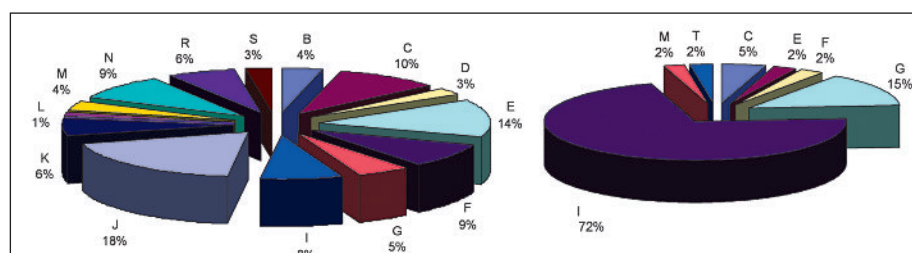
Weakness is a surprisingly common presenting symptom in the emergency department. 19.7% of all non-trauma patients admitted complained of some form of weakness easily recognised by ED nurses and ED physicians.

Localised weakness has been well described and may be called a “stroke-like symptom” [5]. We suggest classifying it as a “specific symptom”, since 76% of these patients are ultimately suffering from TIA or stroke. Interestingly, the 24% “stroke mimics” we found correspond closely to the 31% found in the larger Brain Attack Study, where

Figure 2

a Distribution of ICD-10 diagnoses of 79 consecutive patients presenting to the ED with *generalised weakness*. (pneumonia J18.9, acute renal failure N17.8).

b Distribution of ICD-10 diagnoses of 42 consecutive patients presenting to the ED with *localised weakness*. (TIA: G45.9, stroke: I64).



Legend:

- A 00 – B 99: Certain infectious and parasitic diseases
- C 00 – D 48: Neoplasms
- D 50 – D 89: Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism
- E 00 – E 90: Endocrine, nutritional and metabolic diseases
- F 00 – F 99: Mental and behavioural disorders
- G 00 – G 99: Diseases of the nervous system
- I 00 – I 99: Diseases of the circulatory system
- J 00 – J 99: Diseases of the respiratory system
- K 00 – K 93: Diseases of the digestive system
- L 00 – L 99: Diseases of the skin and subcutaneous tissue
- M 00 – M 99: Diseases of the musculoskeletal system and connective tissue
- N 00 – N 99: Diseases of the genitourinary system
- R 00 – R 99: Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified
- S 00 – T 98: Injury, poisoning and certain other consequences of external causes

the definition of stroke-like symptom was more general (“apparently focal brain dysfunction of apparently abrupt onset”) [1].

Generalised weakness, on the other hand, has rarely been scientifically assessed in the ED setting, despite its obviously frequent occurrence. Hence the absence of a framework, such as definitions, for clinical research. With 13% of all non-surgical emergency admissions, it is the single most frequent presenting symptom, being even more prevalent than chest pain, dyspnoea, abdominal pain and syncope, all of which rank ahead of *localised weakness* (data not shown).

The differential diagnosis of *generalised weakness* is extremely broad and covers the whole field of internal medicine, neurology, geriatrics and even psychiatry [2, 3]. It should therefore be called a “non-specific symptom” since it covers 14 ICD-10 categories, as shown in figure 2. Surprisingly, infections are the most common causes underlying a presentation with generalised weakness. Considering the median age of 78 years, however, it

could well be that fever, cough, and other symptoms more specific for infections are less prominent in the elderly, and that weakness in these cases is so much more prominent that it constitutes a leading complaint in pulmonary, but also other types of infection. The prevalence of electrolyte and other metabolic disorders is less surprising, there being no typical clinical presentation, but weakness may well occur.

According to the WHO ICD-Guidelines only 3 cases had to be encoded as “weakness” (R54), in the absence of another cause for this presenting symptom.

To sum up, the most prominent finding of this study is that *generalised weakness* is most often caused by serious disease requiring immediate attention. This contrasts with the common assumption that unspecific symptoms, such as weakness, are usually benign. Hence further research on non-specific symptom, such as *generalised weakness*, is needed in order to identify causes and risk factors for poor outcome.

References

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