

Systematic review of misdiagnosis of conversion symptoms and “hysteria”

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Abstract

Objective Paralysis, seizures, and sensory symptoms that are unexplained by organic disease are commonly referred to as “conversion” symptoms. Some patients who receive this diagnosis subsequently turn out to have a disease that explains their initial presentation. We aimed to determine how frequently this misdiagnosis occurs, and whether it has become less common since the widespread availability of brain imaging.

Design Systematic review.

Data sources Medline, Embase, PsycINFO, Cinahl databases, and searches of reference lists.

Review methods We included studies published since 1965 on the diagnostic outcome of adults with motor and sensory symptoms unexplained by disease. We critically appraised these papers, and carried out a multivariate, random effect, meta-analysis of the data.

Results Twenty seven studies including a total of 1466 patients and a median duration of follow-up of five years were eligible for inclusion. Early studies were of poor quality. There was a significant ($P < 0.02$) decline in the mean rate of misdiagnosis from the 1950s to the present day; 29% (95% confidence interval 23% to 36%) in the 1950s; 17% (12% to 24%) in the 1960s; 4% (2% to 7%) in the 1970s; 4% (2% to 6%) in the 1980s; and 4% (2% to 6%) in the 1990s. This decline was independent of age, sex, and duration of symptom in people included in the studies.

Conclusions A high rate of misdiagnosis of conversion symptoms was reported in early studies but this rate has been only 4% on average in studies of this diagnosis since 1970. This decline is probably due to improvements in study quality rather than improved diagnostic accuracy arising from the introduction of computed tomography of the brain.

Introduction

Patients with symptoms that suggest a neurological diagnosis—such as paralysis, seizures, and blindness—that are unexplained by disease remain commonplace in neurological practice and account for 1-9% of inpatients and outpatients.¹ They have been called “psychogenic,” “non-organic,” “hysterical,” “medically unexplained,” and sometimes “functional” symptoms, though we have called them all conversion symptoms here.

We carried out a systematic review of all relevant studies published since 1965 to obtain the best estimate of how often patients with an initial diagnosis of conversion symptoms are subsequently given a disease diagnosis that, in hindsight, explained their original symptoms. We also investigated whether the rate of misdiagnosis is lower in more recent studies carried out since the widespread availability of brain imaging.

Methods

Search strategy for studies

We searched Medline (from 1966), CINAHL (from 1982), Embase (from 1980), and PsycINFO (from 1965) to December 2003. See bmj.com for search terms. We reviewed titles and abstracts online and obtained copies of all publications that might conceivably contain relevant data. Reference lists were also examined.

Study inclusion and exclusion

We included studies if the participants were aged > 16 ; symptoms were described as medically unexplained, non-organic, psychogenic, hysterical, conversion, or functional; symptoms described were motor (paresis, paralysis, movement disorder, gait disorder), sensory (numbness or paraesthesia), loss of vision, loss of hearing, or episodes resembling epilepsy (pseudoseizures); the study was of more than 10 patients; and there was a follow-up period of more than six months, at which time some attempt was made to review the accuracy of the initial diagnosis. We excluded studies of patients with other somatoform diagnoses including somatoform pain disorder and somatisation disorder (multiple chronic symptoms unexplained by a general medical condition attributable to several bodily systems).

We considered that a misdiagnosis of conversion disorder had occurred when the investigators concluded that, with hindsight, most of a patient's original symptoms or signs were better explained by a disease. We used the term “disease” to describe a clearly defined pathology (for example, stroke) or a diagnosis that is generally accepted as a medical condition (for example, migraine, dystonia). We did not record a

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BMJ 2005;331:989-91



This is the abridged version of an article that was posted on bmj.com on 13 October 2005: <http://bmj.com/cgi/doi/10.1136/bmj.38628.466898.55>

misdiagnosis if the patient had an initial diagnosis of disease with a comorbid diagnosis of "hysteria" that was subsequently revised to a diagnosis of disease alone. Neither did we record psychiatric misdiagnosis.

Data extraction and analysis

Four investigators independently reviewed all reports and a fifth arbitrated in cases of disagreement. We attempted to contact authors to clarify data where necessary.

We calculated the rate of misdiagnosis in each study as the "number of patients misdiagnosed" divided by the "number of patients followed up including those who died." Firstly, we determined an overall rate of misdiagnosis both by simple pooling of the data and by a random effects model. Secondly, we summarised the data according to the date the initial "conversion" diagnosis was made (rather than study publication date). We summarised these data by charting individual studies according to the midpoint of their recruitment period. We also calculated the proportion of patients with a misdiagnosis for each five year and ten year time period from 1950-99 using random effect models. Thirdly, we examined the relation between the proportion of patients with a misdiagnosis and the variables of age, sex, duration of follow-up, and midpoint of study recruitment.

Results

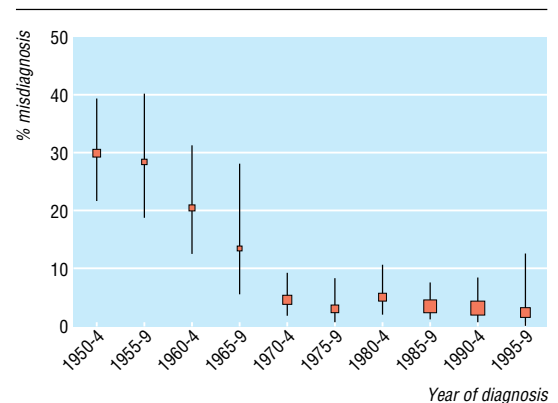
See bmj.com for details of the 27 studies eligible for inclusion, and reasons for ineligibility of other studies.

Analysis of misdiagnosis—The overall proportion of misdiagnoses was 8.4% (95% confidence interval 7.1% to 9.9%) with simple data pooling but 4.2% (2.4% to 7.1%) with the more rigorous random effects model. There has been a clear decline in the rate of misdiagnosis over the past 50 years, from 29% in the 1950s to 17% in the 1960s, 4% in the 1970s, 4% in the 1980s, and 4% in the 1990s (figure). This decline was significant with the random effects model ($P < 0.02$) even after adjustment for patient's age, sex, and duration of symptoms (none of which were related to misdiagnosis in this random effects model). Individual studies were plotted against the midpoint of date of recruitment with an indication of the case definition used: hysteria, specific symptoms such as paralysis and conversion disorder (see bmj.com).

Quality of studies—Many of the studies, especially earlier ones, were of poor quality and ambiguous. If in doubt, we erred on the side of overestimating the rate of misdiagnosis.

Case definition and nature of symptom—In eight studies the nature of the conversion or "hysterical" symptoms was unclear. Although the symptoms were largely neurological, there were also patients with symptoms such as abdominal pain that would not now be regarded as conversion symptoms. We undertook an analysis of symptom specific studies which indicated that the rate of misdiagnosis of pseudoseizures was similar to that reported for motor and sensory symptoms (2.6% ($n = 350$) *v* 4.0% ($n = 373$), $P = 0.28$).

Setting—Only two studies were of outpatients, in whom investigation may be less intensive. Seven studies were of patients referred to psychiatrists. These are likely



Misdiagnosis of conversion symptoms and hysteria (mean %, 95% confidence intervals, random effects) plotted at midpoint of five year intervals according to when patients were diagnosed. Size of each point is proportional to number of subjects at each time point (total $n = 1466$)

to be biased because they comprise patients whom the neurologist was confident enough to refer and who were willing to accept a psychiatric referral. Patients were recruited prospectively in only four studies.

Duration and completeness of follow-up—The median duration of follow-up was five years with a mean follow-up rate of 86%. Five studies lost more than 30% to follow-up. In two the number was unknown.

Method of diagnostic re-evaluation—The ideal standard for diagnostic re-evaluation is for the patient to be examined by an experienced physician (usually a neurologist) with additional investigations as required. No study clearly met this standard: only six reported re-examination by a physician, and none reported on investigations. Other studies used only a combination of interview, self report, and information from general practice records.

Patients with disease and conversion symptoms—Three studies reported on patients who had an initial diagnosis of both disease and conversion symptoms that was subsequently revised to one of disease alone. We did not count these 28 cases as misdiagnoses. Additional information from one study led to two more patients being placed in that category.

Nature of misdiagnosis and cause of death—The nature of the revised diagnosis was reported in 68 out of 123 cases. Epilepsy ($n = 13$), movement disorders ($n = 6$), and multiple sclerosis ($n = 6$) were most common. The presenting symptom of the misdiagnosed patients was described in 52 cases; the most common were gait disorder ($n = 17$), seizures ($n = 13$), and movement disorder ($n = 5$). In the eight cases in which an initial diagnosis of pseudoseizures was later changed to one of epilepsy (and in which the seizure type was described), five had frontal lobe epilepsy—a cause of unusual attacks that can sometimes be missed even by videotelemetry. Possible reasons for misdiagnosis mentioned in the papers were bizarre presenting symptoms and the presence of a psychiatric history. Nearly a third of the recorded deaths at follow-up (13/47) were by suicide. Other causes of death included immobility (without a new organic diagnosis) ($n = 2$), vascular disease ($n = 7$), and cancer ($n = 8$, one brain tumour).

Discussion

In the study of misdiagnosis of conversion symptoms or hysteria the overall pooled proportion for the whole period was 8.4% (7.1% to 9.9%). This overall figure, however, disguises a change over time from 29% in the 1950s and 17% in the 1960s to a consistently low rate of 4% for every decade since then.

There are two possible explanations for this decline. Firstly, diagnostic methods could have improved. Against this hypothesis is the observation that the five yearly misdiagnosis rate fell to 4.4% (2.1% to 9.2%) in the period 1970-4, which is before computerised tomography became generally available.² Also many of the misdiagnosed patients were rediagnosed with conditions such as epilepsy and movement disorders, which even now rely predominantly on a clinical diagnosis. Secondly, early studies may have reported artefactually high rates of misdiagnosis because of poor study methods. In favour of this hypothesis is the observation that the six studies that contributed results to data from the 1950s and 1960s were all poor quality. Studies with poor case definition tended to have a higher rate of misdiagnosis (see bmj.com).

Although a 4% misdiagnosis rate could still be seen as too high, it must be considered alongside rates for other neurological and psychiatric conditions. For example, up to a quarter of patients with a diagnosis of epilepsy have other conditions, most commonly syncope.³ In another study, 8% of patients with a diagnosis of multiple sclerosis were later found to have conversion disorder, illustrating that misdiagnosis can also happen in the opposite direction.⁴

Limitations

There are limitations of the component studies as already described. We included only studies published since 1965. Some studies published before this date had misdiagnosis rates of between 13% and 17%, which do not change our conclusions. We did not include studies of other somatoform disorders or of dysphonia and globus pharyngis. We are not aware of any studies of patients with these diagnoses that would alter our general conclusions.⁵ We may have underestimated the latency between diagnosis and publication for four studies where information was unavailable, although this would tend to emphasise rather than contradict our conclusions. Finally, we acknowledge the conceptual limitations of defining a symptom as being "unexplained by disease." All symptoms must ultimately have neurobiological correlates as illustrated by functional imaging studies of patients with conversion symptoms.⁶

Implications

In modern studies the proportion of patients diagnosed as having conversion symptoms that subsequently turn out to be due to disease is low. The decline from a high rate probably reflects poor methods used in earlier studies, more than the present availability of brain imaging. Misdiagnosis may be more common in patients with gait and movement disorders and in those with a psychiatric history.

While concern about misdiagnosis may be helpful in encouraging a thorough assessment, it may be unhelpful by leading to overinvestigation and delayed treatment for what are potentially reversible conversion symptoms. We suggest that the balance between concern about missing disease and neglecting the

What is already known on this topic

Older studies reported unacceptable rates of misdiagnosis of conversion symptoms and hysteria

More recent studies have found lower rates, similar to those seen in other neurological and psychiatric disorders

What this study adds

The reported rate of misdiagnosis of conversion symptoms has, on average, been 4% since 1970

This decline occurred before the widespread introduction of computed tomography, suggesting that this was not the reason for improved diagnostic accuracy

Early studies were of poor quality and often used a vague definition of "hysteria"

The most commonly missed symptoms related to disease were gait and movement disorders

value of a positive diagnosis of a reversible conversion symptom needs to be redressed.

We thank A Feinstein, F C Moene, C J Mace, M E Sabbioni, L M Selwa, M R Trimble, and B Will for their help with queries about their data.

Contributors: See bmj.com

Funding: JS was supported by the chief scientist office, Scotland.

Competing interests: None declared.

Ethical approval: Not required.

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(Accepted 16 August 2005)

doi 10.1136/bmj.38628.466898.55

Endpiece

The latest caprice in medicine, 1857

That reminds me to ask, Does your Father prescribe *Pepsien* in stomach complaints? Has he ever seen the blessed thing? Ever heard of it? If he haven't, no more shame to him, than had he missed to hear of the pretty little French Empress's very latest caprice in dress! This *Pepsien* (I don't know if I spell it right; but as the word is made out of *dyspepsia* without the *dis*, I can't be very wrong) is just the latest caprice in Medicine; that's all!... The Doctors here are prescribing it at no allowance; and the druggists say they can't get enough for the demand.

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