

“Is he awake?”: Dialogues between callers and call handlers about consciousness during emergency calls for suspected acute stroke.

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ABSTRACT

Background

Altered consciousness is an important symptom of acute stroke but assessment may be challenging when cognitive or language deficits are present. Callers are routinely questioned about conscious level by emergency medical services (EMS) call handlers for any presenting problem.

Objective

This study aimed to identify and compare how patients' conscious level was questioned, described and interpreted by callers and call handlers during acute stroke calls.

Method

Audio recordings of 643 EMS calls for patients with suspected or confirmed acute stroke, admitted to one hospital in NW England over a 12-month period were retrieved from EMS recordings. Calls from primary care physicians were excluded.

The caller's response to two standard questions was coded: 'Is the patient conscious?' and 'Is he/she completely awake?', and other relevant dialogue. Responses which suggested misinterpretation of terms relating to conscious level, or where the call handler used additional clarifying questions, were analysed in detail.

Results

109/643 (17%) of the calls had an altered level of consciousness recorded on the ambulance report form.

Calls often contained unscripted, protracted dialogue about conscious level. Conscious level was difficult for the caller to determine, miscommunicated, or conflated with breathing difficulties.

Conclusion

Ambiguities and contradictions in dialogue about conscious level arise during ambulance calls for suspected and confirmed stroke. Further study is needed to identify whether these issues also arise in non-stroke calls, and which terms are best understood by the public in describing conscious level.

INTRODUCTION

Acute stroke is a medical emergency, in which timely access to emergency medical treatment, notably thrombolytic therapy, is vital to reduce mortality and morbidity. However, symptoms of acute stroke are not always easy for bystanders to recognise. Public information campaigns about common symptoms, such as the 'FAST' (Face, Arm, Speech, Time) test, have been implemented in many countries including the UK, USA and Australia to expedite help-seeking behaviour. Prompt access to emergency stroke services also depends on a bystander's (usually not the patient themselves) identification and interpretation of the symptoms as requiring EMS response, callers' ability to communicate with the EMS call handler about the patient's symptoms, and the call handler's questioning and listening skills.

Clinical presentation of acute stroke often includes an altered state of consciousness. This is an important sign of stroke severity and prognostic indicator [1]. Consciousness is defined as *'the state of being aware of physical events or mental concepts. Conscious patients are awake and responsive to their surroundings'* [2].

The question 'is he/she conscious?' is routinely asked by EMS call handlers to determine the presence of life-threatening conditions, and is included as a standard question in computer-aided systems such as the Advanced Medical Priority Dispatch System (AMPDS v11.3) used by over 3000 agencies worldwide. Assessment of the patient's conscious level is an important factor in correctly coding and prioritising calls to ensure the appropriate level of response. In the UK at the time of this study, EMS calls were prioritised as Category A (attendance at the scene within 9 minutes); Category B (16 minutes) or Category C (up to 60 minutes). However, laypersons' understanding of the term 'conscious' is known to be poor [3]. While healthcare professionals utilise tools such as the Glasgow Coma Scale (GCS) AVPU score (Alert, Voice, Pain, Unconscious) and the National Institutes of Health Stroke Scale (NIHSS), to assess patients' responses to stimuli and thus identify patients with

reduced or fluctuating levels of consciousness, these are not generally available to untrained bystanders and do not feature in media campaigns.

The present study originated from the ESCORTT programme, an NIHR funded programme of research that aims to improve the timeliness and accuracy of pre-hospital diagnosis of stroke [4,5]. During analysis of a data set collected for this programme, the theme of misunderstanding of conscious level emerged. Despite the importance of impaired conscious level as an important adverse prognostic sign in acute stroke, it is often also associated with stroke mimics such as epilepsy and metabolic causes. Patients with an altered level of consciousness need to receive the highest priority of ambulance dispatch to enable urgent medical assessment. We undertook a secondary analysis of EMS recordings relating to discussion of conscious level in patients with symptoms suggestive of acute stroke.

OBJECTIVE

To identify how patients' conscious level was questioned, described and interpreted by callers and EMS call handlers.

METHODS

Design

Retrospective Audit.

Setting

Regional EMS and two acute hospital trusts in the North West of England serving a diverse urban/rural population of 650,000.

Participants and Sampling

Audio recordings of EMS calls for patients with symptoms suggestive of acute stroke, a subsequent in-hospital diagnosis of stroke, or both, admitted to one hospital in the North

West of England over a 12 month period (1st October 2006 to 30th September 2007) were retrieved.

Inclusion criteria: patients who were admitted to hospital with symptoms suggestive of stroke, a subsequent in-hospital diagnosis of acute stroke, or both. Calls were included in the secondary analysis if misinterpretation or protracted dialogue (or both) about the patient's level of consciousness were apparent.

Exclusion criteria: Patients under 18 years. Calls made by a family physician (or receptionist) on behalf of the patient.

Approval for this study was granted by the Patient Information Advisory Group, the Local Research Ethics Committee and by the Faculty of Health Ethics Committee at the host university.

Data collection and analysis

Through a retrospective audit of patient case notes and ambulance report forms, patients' records were identified and the corresponding EMS calls were analysed. Demographic and dispatch information was also collected from EMS records (location of the patient, dispatch code and prioritisation category). The relationship of the caller to the patient was inferred from the content of the call. The level of consciousness documented by EMS staff following clinical assessment was also ascertained.

Audio recordings of EMS calls were listened to in full by one of three researchers (SJ, JMc, JG). Calls were analysed by coding the key words used to describe the conscious level of the patient. This analysis focused on the caller's response to the two standard questions asked by the call handler about conscious level: 'Is the patient conscious?' and 'Is he/she completely awake?' Any other dialogue during the call which related to conscious level or alertness was also included in the analysis. Responses from the caller which suggested misinterpretation of terms such as conscious, awake, responsive or alert, and where the call

handler had to use additional questions to clarify the patient's level of consciousness, were analysed in detail.

A second researcher independently followed the same procedure and any discrepancies were resolved by discussion between the researchers. Relationships between the responses to the two standard questions were mapped.

RESULTS

There were 643 calls in the data set, of which 109 patients (17%) had been noted to have an altered level of consciousness documented by attending EMS personnel. Of these, 44 (40%) calls had required further clarification of the patient's level of consciousness by the call handler and were included in the analysis. Of these calls 30 (68%) were dispatched as Category A, 5 (11%) as Category B, 2 (5%) as Category C and no category of dispatch was recorded in the ambulance report forms for 7 (16%). All 44 calls were made by a bystander (e.g. a family member), not by the patient themselves. Demographic information for patients and callers is summarised in Table 1.

Table 1. Characteristics of patients and callers.

Patient	
Age (mean) [standard deviation]	74.5 years [11.8]
Female (%)	21 (47%)
Location: At home (%)	35 (80%)
Location: Nursing/care home (%)	6 (14%)
Location: Public place (%)	2 (5%)
Location other: Primary care centre (%)	1 (2%)
Caller	
Age (mean)	Unavailable
Female (%)	19 (43%)
Caller Relationship	
Male family member (%)	13 (29%)
Female family member (%)	13 (29%)
Nursing or care home staff (%)	8 (18%)
Neighbour (%)	2 (5%)
Friend (%)	2 (5%)
Other (%) e.g. landlord, sheltered accommodation staff	6 (14%)

In the 44 calls included in this analysis, responses to the initial standard question 'Is he/she conscious?' were as follows:- 14 callers replied that the patient was conscious, 5 stated that they were unconscious, 9 stated that they were 'semi-conscious' or used a similar term, and 16 were unable to state whether or not the patient was conscious. Of the 19 callers who gave a clear 'yes' or 'no' response initially, subsequent questioning by the EMS call handler brought the accuracy of this response into doubt.

In many calls there was apparent misunderstanding or clarification needed about the patient's level of consciousness. This entailed unscripted or protracted dialogue between the

caller and call handler. In response to an equivocal statement by the caller, the call handler would repeat, paraphrase or reverse the standard questions, usually until a 'yes' or 'no' response was received. Even then, the final response itself might be qualified by the caller with some additional information. An example is shown in Table 2. In this case, the call handler repeatedly asks if the patient is 'conscious' or 'awake', but receives equivocal responses. The question is then reversed to ask: 'Is he unconscious?', yet still fails to elicit a clear yes-no response from the caller.

Table 2. Protracted dialogue during call about patient's level of consciousness

<p><i>Caller: He's not quite with it, he can't speak properly or anything.</i></p> <p><i>Call handler: Is he conscious?</i></p> <p><i>Caller: Well not really.</i></p> <p><i>Call handler: Is he awake?</i></p> <p><i>Caller: Not properly no.</i></p> <p><i>Call handler: Is he awake at all, is he...</i></p> <p><i>Caller: No, no, no.</i></p> <p><i>Call handler: Is he unconscious?</i></p> <p><i>Caller: Yes, we just keep, if you speak to him he sort of mutters.</i></p>

Questions asked by call handlers to clarify patients' conscious level included variations on the standard questions 'is he/she conscious?' and 'is he/she completely awake?' There were also variations on a further question, 'is he/she able to talk normally?' which was prompted if the call had been identified as suspected stroke by the call handler. This question was not prompted for calls which were coded as another presenting problem such as fall.

Clarifying questions used by call handlers fell into 4 categories: conscious level; level of awokeness, awareness or alertness; patient's ability to talk; and patient's response to stimuli (usually verbal) (Table 3).

Table 3. Typical wording of questions asked by call handlers

<p>1. Questions about conscious level</p> <p>At the moment, is he conscious?</p> <p>Is he unconscious?</p> <p>Is she still unconscious?</p> <p>So she's not conscious?</p> <p>She's not unconscious?</p>
<p>2. Questions about awakesness, awareness or alertness</p> <p>Is he awake at all? Sorry, is he?</p> <p>Is he completely awake?</p> <p>So you can't wake him?</p> <p>Are her eyes open?</p> <p>Did she open her eyes or?</p> <p>Is she aware of her surroundings?</p> <p>Is she alert?</p> <p>Is he alert to what's going on?</p> <p>Would you say she was alert?</p>
<p>3. Questions about patient's ability to talk</p> <p>Is she able to talk?</p> <p>Is he able to talk normally?</p> <p>So he's not able to talk to you?</p> <p>Can she breathe or talk at all?</p>
<p>4. Questions about patient's responsiveness to stimuli</p> <p>Is she responding to you?</p> <p>Is he responding?</p> <p>Will he respond?</p> <p>So she's not responding?</p> <p>Right, she's not responding?</p> <p>Does she respond at all?</p> <p>So (she's) not responding if you call her name out or try to talk to her?</p>

In contrast to the semi-scripted line of questioning from the call handler, callers engaged in protracted and discursive descriptions of the patient's conscious level. Three themes were identified within the dialogues:

1. Caller's difficulty in determining conscious level.
2. Miscommunication and need for clarification of stated conscious level.
3. Association of conscious level with breathing.

1) Difficulty in determining conscious level

Some callers were unable to clearly assess or describe the patient's conscious level. This occurred when the patient was not obviously fully conscious nor completely unconscious, or when the level of consciousness appeared to be fluctuating, when terms such as 'semiconscious' were used. There was also misunderstanding due to the presence of other acute stroke symptoms such as speech difficulty or cognitive impairment, when the patient was not fully responsive despite being clearly 'awake'.

Example 1:

Call handler: Is she awake?

Caller: Yes she's awake ... she's conscious... but she's not talking to me yet.

Example 2:

Call handler: Is he conscious?

Caller: Yes.....he's fully alert and awake...he's awake but not responding to what I'm saying... he doesn't seem to be with it.

Where the caller was unable to determine clearly whether the patient was 'conscious' or 'not conscious', they often used other colloquial terms to describe the patient's condition.

Example 3:

Call handler: Is she conscious?

Caller: She's partly conscious. She's not unconscious ...she's halfway there.

Example 4:

Call handler: Is she conscious?

Caller: Yes, I don't know, I can't tell. I think she's semi-conscious.

2) Miscommunication and need for clarification of conscious level

When asked by the call-handler if the patient was conscious, of the 14 callers who gave a clear response of 'yes', 6 gave additional and often contradictory information when questioned further. 16 other callers were unsure when initially questioned by the call-handler. Of 5 callers who initially answered 'no', all but one changed their assessment (2 to 'conscious', 1 to 'semiconscious'; 1 patient regained consciousness).

In some cases, the caller initially gave a clear response of 'Yes' to the question of whether the patient was conscious, but then gave additional information during the call (often in response to the standard questions 'is he/she awake?'). This additional dialogue served either to give a more detailed assessment of the patient's conscious level, or to convey additional information that contradicted the original response.

Similarly, there were instances where the caller initially gave a clear response of 'No' when asked if the patient was conscious, but then contradicted this, or gave a more detailed description (table 4). Although the caller may have given a clear 'yes' or 'no' response to the initial question about conscious level, it was only when subsequent questions were asked that the response to the initial question appeared to be inconsistent with the patient's actual condition.

Table 4. Examples of callers' and call handlers' clarification of original 'yes/no' responses to the question 'is he/she conscious?'

	Original response qualified with additional dialogue	Original response contradicted
Original response – 'yes'	<p>Call handler: Is she conscious?</p> <p>Caller: Yes.</p> <p>Call handler: Is she awake?</p> <p>Caller: She is sort of but she keeps sort of going asleep.</p> <p>-----</p> <p>Call handler: Is she conscious?</p> <p>Caller: Yes she's conscious ... she's completely awake but she's very, very drowsy.</p>	<p>Call handler: Is she conscious?</p> <p>Caller: Yes but when I say she's conscious, but I can't seem to rouse her, do you know what I mean.</p> <p>-----</p> <p>Call handler: Is he conscious?</p> <p>Caller: Yes no, I can't, no he's not conscious. He won't wake up.</p>
Original response – 'no'	<p>Call handler: Is she conscious?</p> <p>Caller: No, come on quickly.</p> <p>Call handler: Is she still unconscious?</p> <p>Caller: She's half way, more or less unconscious.</p>	<p>Call handler: Is he conscious?</p> <p>Caller: No.</p> <p>Call handler: Is he awake?</p> <p>Caller: He is awake, yes.</p>

Association of conscious level with breathing difficulties

The AMPDS protocol prompts call handlers to ask firstly 'Is he/she conscious?', and then 'is he/she breathing?' However, some caller's responses suggested that they equated 'conscious' with 'breathing', or suggested that the patient was conscious yet not breathing:

Example 11:

Call handler: Is he conscious?

Caller: Yes, he's breathing, yes, yes.

Call handler: Is he conscious?

Caller: No I can't, no he's not conscious. He won't wake up.

Example 12:

Call handler: Is she conscious?

Caller: Yes she's conscious but she's not breathing... her eyes are open, you know, but she's not breathing... she can't breathe or talk at all.

DISCUSSION

This is the first study that has explored the difficulty between the public and the EMS in communicating about conscious level during EMS calls for patients with symptoms suggestive of acute stroke.

EMS calls are one example of 'institutional talk' [6]. Such interactions are partly or wholly scripted, or follow additional rules to those in everyday conversation, in order to achieve a specific outcome. In the case of EMS calls, the intended outcome is the classification of the urgency and nature of the patient's presenting problem in order to facilitate the provision of appropriate and timely emergency medical care. However, the highly structured format of the caller-call handler dialogue, and the nature of the medical emergency situation, may make it difficult for callers to ask for clarification of medical terms used by the call handler, and to convey uncertainty about their interpretation of the patients' symptoms.

It is generally accepted that public knowledge of the term conscious is poor [3]. Nonetheless, the term is used routinely in both the AMPDS system, and in the NHS Pathways programme which is being implemented in some EMS systems in the UK. In response to partial, equivocal and sometimes contradictory statements made by callers about patients'

conscious level, call-handlers resort to the use of other questions and terms such as awake, alertness, responsiveness and speech/communication, in order to more fully elicit the patient's level of consciousness. This can lead to protracted, time consuming and often somewhat confusing dialogue as the caller attempts to convey the nuances of the patient's level of consciousness.

The widely used Glasgow Coma Scale [7] comprises three responses (motor, eye opening and speech) to assess conscious level. Its use is problematic in stroke patients as those with aphasia may be unable to speak and yet may be fully conscious and alert. The National Institutes for Health Stroke Scale (NIHSS) utilises a 4-point scale which enables a more accurate delineation of the patient's conscious level in stroke. In contrast, the dichotomous nature of questioning about conscious level in EMS protocols does not allow for recognition of gradations of conscious level, other than a simple 'yes/no' response.

Many acute stroke patients experience symptoms of aphasia or cognitive impairment [8]. Such presentations may make it more difficult for a bystander to distinguish 'true' changes in conscious level [9], and adds to the challenge of conveying the patient's actual level of consciousness to the call handler. It can therefore be difficult for callers to swiftly and accurately assess the conscious level of a patient with acute stroke symptoms and to communicate this information with the call handler.

In our study, attending EMS personnel documented that 17% (109/643) of patients had an altered conscious level, within the range of previously reported prevalence rates of 16% to 41% in stroke [9-13]. Although some patients' conscious level may have deteriorated or improved between the initial call and ambulance arrival, it is also possible that impaired conscious level was underreported during the emergency calls.

Although family physician-initiated calls were excluded from this study, we included calls from nursing and residential care home settings. Some of these did not provide an unequivocal description of the patient's conscious level, but tended to describe altered

conscious level using subjective terms such as 'drowsy' and 'unresponsive', rather than giving a 'yes/no' answer to the call handler.

Our findings suggest that, despite its wide use in medical practice and specifically in EMS dispatch protocols, the term 'conscious' is not widely understood and is poorly communicated by bystanders when making EMS calls about patients with symptoms suggestive of acute stroke. This phenomenon may lead to imprecise, contradictory and lengthy information exchange which may be time wasting, misleading and potentially dangerous.

LIMITATIONS

We were unable to verify patients' actual level of consciousness at the time the EMS call was made. We used data recorded by attending EMS personnel on or shortly after arrival at the scene as a proxy for this. However, the patient's conscious level could have improved or deteriorated since the time the call was made. We were limited in the amount of data we were able to collect about caller characteristics, since such information is not routinely obtained during EMS calls. Our findings were restricted to calls relating to patients with suspected stroke, but there are, of course, many other emergency conditions which affect level of consciousness.

CONCLUSIONS

Routine questioning of EMS callers about a patient's conscious level is important to help prioritise the EMS response, but is characterised by ambiguities or contradictions in statements made by callers. When there is a reduced or fluctuating level of consciousness, cognitive or speech impairment, a dichotomous 'yes or no' answer does not capture nuances of the patient's condition. The closed nature of routine questioning may be unhelpful and is therefore supplemented by both call handlers and callers with additional unscripted questions and colloquial responses. Although our study relates only to patients with acute stroke, our findings have implications for other EMS calls. It is possible that the issues

described in this paper are also found in emergency calls about patients with other conditions associated with acute changes in conscious level. Irrespective of the 'yes' 'no' response to the initial question about conscious level, it is important to identify any patient with a fluctuating or reduced conscious level, as well as those that are described as 'unconscious', as their condition should always be allocated the highest priority of dispatch. Further research is needed to explore this, and to inform EMS call handler education and future public awareness campaigns. Further work is also needed with members of the public to identify which term or terms are best understood in conveying altered levels of consciousness in emergency situations.

Key Points

- The technical term 'conscious' may have a different meaning to different members of the public.
- Bystanders have difficulty in communicating levels of consciousness for patients with acute stroke, using a variety of colloquial terms to describe the situation, and may give contradictory responses.
- Call-handlers often use non-standard terms other than 'conscious' to further explore and clarify a patient's level of consciousness.
- Further exploration is required into the use of different questions or tools to assess conscious level in order to determine if these could help communication about consciousness in patients with acute stroke and other conditions requiring an EMS response.

What this paper adds...

Assessment of the patient's conscious level is an important factor in correctly coding and prioritising calls to ensure the appropriate level of response. However, laypersons' understanding of the term 'conscious' is known to be poor.

Public understanding of the term 'conscious' varies, resulting in a variety of terms

presented to emergency call handlers. Furthermore, call handlers use non-standard terms to explore the consciousness level of a patient. Further exploration is required to support understanding of the term 'conscious' between the public and call-handlers.

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COMPETING INTERESTS

All authors have completed the Unified Competing Interest form at www.icmje.org/coi_disclosure.pdf (available on request from the corresponding author) and declare: no support from any organisation for the submitted work; no financial relationships with any organisations that might have an interest in the submitted work in the previous three years; no other relationships or activities that could appear to have influenced the submitted work.

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