



'She's sort of breathing': What linguistic factors determine call-taker recognition of agonal breathing in emergency calls for cardiac arrest?



Marine Riou^{a,*}, Stephen Ball^a, Teresa A. Williams^{a,b,c,d}, Austin Whiteside^b, Peter Cameron^e, Daniel M. Fatovich^{a,c,d,f}, Gavin D. Perkins^g, Karen Smith^{c,e,h,i}, Janet Bray^{a,e}, Madoka Inoue^a, Kay L. O'Halloran^j, Paul Bailey^{a,b}, Deon Brink^{a,b}, Judith Finn^{a,b,c,e}

^a Prehospital, Resuscitation and Emergency Care Research Unit (PRECRU), School of Nursing, Midwifery and Paramedicine, Curtin University, Bentley, WA 6102, Australia

^b St John Ambulance (WA), Belmont, WA 6104, Australia

^c Emergency Medicine, The University of Western Australia, Crawley, WA 6009, Australia

^d Emergency Medicine, Royal Perth Hospital, Perth, WA 6001, Australia

^e Department of Epidemiology and Preventive Medicine, Monash University, Victoria 3004, Australia

^f Centre for Clinical Research in Emergency Medicine, Harry Perkins Institute of Medical Research, Royal Perth Hospital, WA 6847, Australia

^g Warwick Clinical Trials Unit and Heart of England NHS Foundation Trust, University of Warwick, Coventry, CV4 7AL, United Kingdom

^h Department of Community Emergency Health and Paramedic Practice, Monash University, Victoria 3004, Australia

ⁱ Ambulance Victoria, Blackburn North, Victoria 3130, Australia

^j School of Education, Curtin University, Bentley, WA 6102, Australia

ARTICLE INFO

Article history:

Received 13 September 2017

Received in revised form 27 October 2017

Accepted 24 November 2017

Keywords:

Out-of-hospital cardiac arrest

Recognition

Agonal breathing

Emergency medical services

Dispatch

Emergency calls

Communication

Conversation analysis

ABSTRACT

Background: In emergency ambulance calls, agonal breathing remains a barrier to the recognition of out-of-hospital cardiac arrest (OHCA), initiation of cardiopulmonary resuscitation, and rapid dispatch. We aimed to explore whether the language used by callers to describe breathing had an impact on call-taker recognition of agonal breathing and hence cardiac arrest.

Methods: We analysed 176 calls of paramedic-confirmed OHCA, stratified by recognition of OHCA (89 cases recognised, 87 cases not recognised). We investigated the linguistic features of callers' response to the question "is s/he breathing?" and examined the impact on subsequent coding by call-takers.

Results: Among all cases (recognised and non-recognised), 64% (113/176) of callers said that the patients were breathing (yes-answers). We identified two categories of yes-answers: 56% (63/113) were plain answers, confirming that the patient was breathing ("he's breathing"); and 44% (50/113) were qualified answers, containing additional information ("yes but gasping"). Qualified yes-answers were suggestive of agonal breathing. Yet these answers were often not pursued and most (32/50) of these calls were not recognised as OHCA at dispatch.

Conclusion: There is potential for improved recognition of agonal breathing if call-takers are trained to be alert to any qualification following a confirmation that the patient is breathing.

© 2017 Elsevier B.V. All rights reserved.

Introduction

During emergency medical calls, after determining whether the patient is conscious, call-takers ask callers whether the patient is breathing, and/or whether the patient is breathing normally. Breathing assessment is a challenging task for callers [1] as well

as for call-takers, [2] but it is commonly used to help identify time-sensitive emergencies such as out-of-hospital cardiac arrest (OHCA). A reflexive breathing pattern referred to as 'agonal breathing'[3,4] can sometimes be observed in the first few minutes after cardiac arrest. [5,6] Agonal breathing presents a window of opportunity as it indicates that OHCA has recently occurred and therefore there is a higher likelihood of survival [7,8] if cardiopulmonary resuscitation (CPR) is started immediately. The paradox [9] is that lay rescuers often mistake agonal breathing for effective breathing and thus OHCA patients can be incorrectly assessed as breathing [10,11], thereby delaying any resuscitation attempt.

* Corresponding author at: Resuscitation and Emergency Care Research Unit (PRECRU), School of Nursing, Midwifery and Paramedicine, Curtin University, GPO Box U1987, Perth, WA 6845, Australia.

E-mail address: marine.riou@curtin.edu.au (M. Riou).

The question of whether the patient is breathing is binary and seeks to elicit a “yes” or “no” answer. However, callers often volunteer additional information about the patient’s breathing (“yes but barely”). Previous research has identified common descriptors [3,8,12] These are typically integrated into the dispatch protocols used by Emergency Medical Services. For example, the Medical Priority Dispatch System (MPDS) [14] lists the following terms as indicators of ineffective/agonal breathing: “barely breathing”, “can’t breathe at all”, “fighting for air”, “gasping for air”, “just a little”, “making funny noises”, “not breathing”, and “turning blue/purple”.

However, even with such descriptors in place, agonal breathing remains a major barrier to the recognition of OHCA at dispatch and thus delays initiation of bystander-CPR [11,16–18] Interpreting what callers say is not just a matter of which keywords are said; but also of the overall context of their answers. This study aimed to determine whether the type of sentence used by callers in response to the question “*Is s/he breathing?*” had an impact on call-taker recognition of agonal breathing and thus; identification of OHCA.

Methods

Data collection

We retrospectively analysed a random selection of emergency medical calls received by St John Ambulance Western Australia (SJA-WA) between 1 January 2014 and 31 December 2015 for paramedic-confirmed OHCA that occurred in Perth. A flowchart for the data collection is presented in Fig. 1. As detailed in the overarching study protocol, [19] there were 3513 OHCA cases attended by SJA-WA paramedics during the study period. Of those, 1382 cases met the following initial criteria: non-traumatic OHCA in adults (≥ 14 years old) where the paramedics attempted resuscitation, no impediment to paramedic attendance, incidents with a single OHCA patient, OHCA not witnessed by paramedics, and cases for which the dispatch data were available. Due to the detailed analysis involved, we were unable to examine every call, thus a randomly selected subset was used. The cases meeting the initial criteria were listed in a randomised order (using Microsoft Excel 2013). We worked through this list sequentially until reaching the target of 200 cases: 100 calls in which cardiac arrest was recognised by the call-taker and 100 calls in which cardiac arrest was not recognised by the call-taker. This stratification by OHCA recognition was necessary because non-recognition is rarer (estimated <15% for the study period), and yet, these cases provide invaluable insight as to what linguistic factors can negatively impact dispatch. We excluded the following: cases in which the patient was unequivocally conscious, the caller was not a lay bystander, the caller was not on scene, the caller and/or call-taker was not a native speaker of English, and calls with very poor sound quality.

After listening to the 200 randomly selected calls, we excluded a further 12 calls: 7 calls because the call-takers did not ask the question “*is s/he breathing?*”; 3 calls because the call-takers asked two protocol questions at the same time (“*and he’s not awake and not breathing is that right?*”); and 2 calls because the call-takers asked the question in a negative format (“*and he’s not breathing at all?*”). Closer inspection of the electronic Patient Care Records led to the exclusion of 12 cases because OHCA was paramedic-witnessed. Consequently, this study was conducted on 176 calls.

Dispatch protocol

During the study period, SJA-WA used the MPDS (version 12.1.3), implemented with the ProQA software.[20] Calls start with

a case entry sequence, with the following steps: after confirming (1) the address and (2) telephone number of the emergency, the call-taker (3) delivers the prompt “*okay, tell me exactly what happened*”, and asks the questions (4) “*Are you with the patient now?*”, (5) “*How old is s/he?*”, (6) “*Is s/he awake?*”, and (7) “*Is s/he breathing?*”. Based on the caller’s answers, the call-taker assigns the call to one of 32 Chief Complaints, representing the primary nature of the patient’s emergency. Depending on the MPDS protocols for specific Chief Complaints, further questions about breathing may be asked after case entry, e.g. “*is s/he breathing normally?*” in the case of chest pain. This study focuses on initial breathing assessment during case entry, i.e. how callers responded to item (7) “*is s/he breathing?*” Fig. 2 summarises the overall structure of calls using the MPDS.

Analysis of dispatch data

We retrieved the following data from ProQA for each of the 176 calls:

1. Breathing status entered by call-takers, chosen from four possible options (breathing, not breathing, ineffective, unknown).

2. OHCA recognition: we considered that OHCA was recognised at dispatch in the presence of at least one of the following elements: (a) The dispatch code indicated cardiac arrest, (b) MPDS protocol steps for CPR were taken, (c) Two Priority 1 (“lights and siren”) paramedic-staffed ambulances were dispatched, as SJA-WA automatically allocate dual responses to suspected cardiac arrest cases.

Initial breathing assessment is the first opportunity to recognise OHCA. However, OHCA can also be recognised later in the call [16] for patients initially coded as breathing.

Additionally, we investigated the timing of the **breathing sequence**. The breathing sequence is defined as the pair formed by the call-taker’s question (“*is s/he breathing?*”) and the caller’s response (e.g., “*no*”). It can include a third turn, [21,22] i.e., an additional utterance expanding or closing the sequence after the caller’s response (e.g., “*okay so not breathing*”). Two measures of timing were taken:

1. Time to breathing sequence (from call start to call-taker’s question)
2. Duration of breathing sequence (from call-taker’s question to caller’s response, or to third turn if present).

Linguistic analysis

The calls were transcribed following the methodology of Conversation Analysis. [23] We coded caller response to the question “*is s/he breathing?*” using a coding scheme [24] developed for a cross-linguistic study of question-answer pairs. [25] Caller response was classified into two categories (response type):

1. **Answers** directly addressed the terms of the question. Answers could be a confirmation (“*she is*”) or a disconfirmation (“*no*”). We refer to confirming answers globally as *yes-answers*, and to disconfirming answers as *no-answers*.
2. **Non-answer responses** did not directly address the terms of the question (“*I don’t know*”)

Additionally, we coded caller answers as **qualified answers** if they contained any words modifying them (“*but gasping*”, “*sort of*”), and as **plain answers** otherwise.

Statistical analysis

We used logistic regression to analyse the relationship between response type and OHCA recognition. Time measures were

Download English Version:

<https://daneshyari.com/en/article/8675862>

Download Persian Version:

<https://daneshyari.com/article/8675862>

[Daneshyari.com](https://daneshyari.com)