



Original article

A qualitative study of COVID-19 related reasons for delayed presentation of patients with chest pain during the COVID-19 pandemic

Hanlie Dreyer^{a,*}, Katya De Oliveira^b, Vidya Laloo^c, Andreas Engelbrecht^c

^a Division of Emergency Medicine, Department of Health, Steve Biko Academic Hospital, Pretoria, South Africa

^b Division of Emergency Medicine, LE Genote, Life Wilgers Hospital, Pretoria, South Africa

^c Division of Emergency Medicine, Faculty of Health Sciences, University of Pretoria and Steve Biko Academic Hospital, Pretoria, South Africa



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ABSTRACT

Introduction: In previous pandemics such as the Ebola virus outbreak in West Africa, it has been observed that patients with non-pandemic related complaints, delay their presentation to hospital. Similarly, delayed presentation of patients with chest pain during the COVID-19 pandemic has been documented. This qualitative study identified the COVID-19 related reasons which lead to this delay.

Methods: A qualitative study based on 10 individual patient interviews. Half of these were conducted at a public hospital emergency centre (EC) and the other half at a private EC.

Results: A variety of psychosocial factors were identified as themes for delayed presentation. Interestingly, the fear of contracting COVID-19 at the hospital was not found to be an important theme in our study. Rather, confusion around hospital protocols during the pandemic was identified as a recurrent theme.

Discussion: This study found that confusion about COVID-19 hospital protocols was the major pandemic related delaying factor. A number of themes unrelated to COVID-19 were also identified.

African relevance

- As of 31 August 2021, South Africa has more than 2,7 million cases of COVID-19 with more than 81,000 deaths.
- Cardiovascular disease causes 13% of deaths in sub-Saharan Africa.
- Delayed presentation of patients with non-pandemic related symptoms, is often reported as a concern in countries of the developing world.

Introduction

In March 2020, the World Health Organization (WHO) declared COVID-19 a global pandemic [1]. As of August 31st 2021, over 217 million people have been diagnosed with the disease [2]. In order to prevent the spread of disease, countries have enforced various levels of “lockdown”. From March 26th 2020, the South African government declared a national lockdown [3]. A presupposition during lockdown was that patients would present swiftly to hospital when faced with life-threatening illnesses. However, it has become globally evident that the overall number of patients presenting to hospitals have drastically diminished [4,5]. Anecdotal experience is that patients with life-

threatening conditions are presenting late. This poses the question, why do people delay seeking help for life-threatening medical conditions during a pandemic?

Acute coronary syndrome (ACS) is a broad term for a range of conditions causing myocardial ischaemia which includes unstable angina, non-ST elevation myocardial infarction or ST elevation myocardial infarction [6]. Cardiovascular disease causes 13% of deaths in sub-Saharan Africa [7] of which ACS is an important component. Since chest pain is a red flag symptom of ACS [6,8,9] this makes it an ideal symptom to study regarding delayed presentation. Since the onset of COVID-19, various studies suggest that patients with myocardial infarction have presented later than pre-COVID-19 [10–12]. Some of these quantitative research studies propose that patients delay presentation out of fear surrounding COVID-19 [12–14], however none have tested this assumption. Retrospective analysis of patient numbers presenting with chest pain revealed an average of 70 per month pre-COVID-19 versus 45 per month during the first COVID wave at the private institute in which this study was conducted. Anecdotally, a similar change has taken place at the public hospital. Unfortunately, access to data has not been accessible due to the increased workload on the administrative clerks during the COVID-19 pandemic.

* Corresponding author at.

E-mail address: hanlie.dreyer@icloud.com (H. Dreyer).

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The purpose of this study was to qualitatively investigate the reasons why patients suffering from chest pain present late to ECs during the pandemic.

Research from previous outbreaks demonstrates that overall patient visits to healthcare facilities decreased. A large systematic review during the 2013–2016 West African Ebola virus outbreak revealed an 18% decline in health care utilization during the outbreak [15].

It is well documented that reperfusion after a myocardial infarct should occur within 2–3 h to preserve myocardial function, but after 6 h there is little to no myocardial salvage [16,17]. For this reason, presentation of a patient with chest pain after 6 h can be considered late.

A study [10] addressing delayed patient presentation during COVID-19 was done in Hong Kong from January 2020 to February 2020. They evaluated the time of symptom onset to time of first medical contact. They noted that patients with ST-elevation myocardial infarctions (STEMIs) during the COVID-19 pandemic had longer median times to presentation, when compared to the previous year.

Research from New York [11], Lithuania [18] and the United Kingdom [19], conducted during the pandemic, report that patients wait longer before presenting with ACS. This results in increased cardiac arrests at home and significantly longer time to first medical contact.

Methods

The University of Pretoria Research and Ethics Committee approved this study (reference number: 464/2020).

A qualitative analysis was done by interviewing patients at a South African private hospital EC and a public central hospital EC, who presented after 6 h of chest pain. The capacities of these units are 12 & 36 beds respectively for the private and public hospitals pre-COVID-19. Additional beds were added to both to accommodate for increasing COVID-19 patient numbers.

This was an explorative qualitative study. It sought an in-depth understanding of themes which are associated with delayed presentation in patients with chest pain. It questioned whether COVID-19 related factors influenced the delay in their presentation.

Patients were chosen based on purposive sampling [20] of patients presenting to the respective ECs before or after the investigators' shifts. All patients identified consented to participating. No purposively sampled patients were excluded based on the exclusion criteria. Sampling of interviewees continued until themes were saturated.

Both investigators attended training by an experienced researcher on interview techniques for qualitative data collection. Purposive sampling was done and the sample size was determined by data saturation [20]. Interviews were conducted in person by the investigator on call at the respective ECs. Patients presenting with chest pain which started more than 6-h prior, were screened using the inclusion criteria (Appendix A). The HEART score (≤ 5) was used to identify individuals that along with clinical gestalt were more likely to be stable enough to provide information rich interviews. Exclusion criteria (Appendix B) targeted unstable patients and patients who received more than a single dose of opioids which may have sedative effect on the participant influencing their ability to interview appropriately. No patients received more than a single dose of opioid and therefore no one was excluded on this basis. Medical treatment, including cardiac catheterization, was in no way delayed for the purpose of interviewing a patient. Patients were interviewed in a private setting with audio recording. Social distancing was practiced. The interview was semi-structured. Patients were all asked the predetermined question: "When you started feeling chest pain what thoughts did you have which influenced your decision on when to come to hospital?" Interviewers asked non-leading questions to clarify and expand patients' answers and determine broad themes. The average duration of the interviews was 20 min.

Interviews were transcribed verbatim. Themes were identified by colour coding and analysed by both investigators and the interpretation was mutually agreed upon. Where discrepancies arose, it was discussed

with the research supervisors and consensus was reached. Interviews were conducted in both English and Afrikaans. Interviews conducted in Afrikaans were first transcribed in Afrikaans and then directly translated without summarizing or rewording, into English.

Credibility was achieved using methods of Lincoln and Guba - namely triangulation and member checking [21,22]. The audit trail was maintained to ensure all analysis steps could be traced back to original interviews. Patients were telephoned after all the themes had been identified to confirm that a correct interpretation had been made.

Results

This study consists of ten interviews - five conducted in the public hospital EC and five in the private EC. Patients of all races were included and their ages ranged between 41 and 69 years (Table 1). The interviews were conducted in September and October 2020. The following COVID-19 related themes were identified (Table 2): Logistical, emotional and financial. Various non-COVID-19 related themes were also identified. This manuscript focuses on the COVID-19 related themes.

The most predominant COVID-19 related factor which appeared to delay patients presenting to hospital was uncertainty regarding hospital procedures brought on by the pandemic.

Theme 1: uncertainty regarding COVID-19 hospital procedures

The following excerpts from the interviews illustrate the uncertainty that patients expressed regarding COVID-19 hospital procedures.

"Strange enough I had a thought, maybe hospitals is not admitting at this stage because of the situation with COVID."

"We don't know what are you supposed to do, can you go to the hospital now. Can't you? Is it only severe cases that are allowed? Because you hear of people's, you know, their operations got cancelled. So, I wasn't sure if I should pitch here or not."

"We didn't know how to approach the whole situation. Are we allowed to come? Will we be turned away or what is the situation because I haven't had any contact with that. We phoned our doctor who is a speechie and she said no go straight to [name of hospital]."

Theme 2: emotional factors delaying presentation

Subtheme 2.1 fear related to contracting COVID-19

This was not a strong theme. A single patient stated an initial fear of contracting COVID-19 from the hospital which quickly resolved upon consultation with a friend.

Table 1
Patient demographics.

Interview number	Age	Gender	Race	HEART score ^a	Private or public EC	Duration of pain before presentation
1	54	Male	Coloured	4	Private	13 h
2	68	Male	White	5	Public	3 days
3	60	Female	Coloured	5	Public	6 days
4	48	Male	White	5	Private	3 days
5	52	Female	White	5	Public	2 weeks
6	69	Male	White	4	Public	12 h
7	58	Male	Coloured	5	Private	6 days
8	41	Male	White	5	Public	7 days
9	48	Female	African	5	Private	3 days
10	60	Male	White	2	Private	18 h

^a HEART score (see Appendix A: inclusion criteria).

Table 2
COVID-19 related themes and subthemes identified per patient.

Interview number:		1	2	3	4	5	6	7	8	9	10
Themes	Subthemes										
1.Uncertainty regarding COVID-19 hospital procedures											
2.Emotional factors	Fear related to contracting COVID-19										
	Fear regarding having COVID-19 infection										
	Lack of emotional support due to COVID-19 related visitor restrictions										
3. Financial	Financial strain during lockdown										

“Initially I was a bit scared, but then I asked a Christian friend of ours, does he think [name of hospital] is safe, can I go? He said he thought [name of hospital] was safe. He gave the green light.”

Four of the ten patients stated fear of contracting COVID-19 had no influence in their decision on when to come to hospital. *“So, it wasn’t fear for COVID or that I might have COVID... or that I can contract COVID here.”*

Some of the interviewees expressed the reason for their lack of fear as a decline in COVID-19 numbers after the first wave. The timing of this study coincided with a drop in COVID-19 cases in Gauteng.

“Yeah, funny it didn’t, because there was just a big change and drop in it now, as to what it was. It didn’t go through my mind at all.”

Moreover, some interviewees expressed a change in their fear of contracting COVID-19 over time: *“In the beginning I was very paranoid about the whole COVID thing. We stayed in the house those first two to three weeks, barely looked outside our windows, we were all very paranoid. And then it got easier and I realized I need to continue and work.”*

Subtheme 2.2 fear regarding having COVID-19

Only one patient reported delaying presenting out of fear that the chest pain experienced was from COVID-19 disease itself: *“I think last night it crossed my mind a bit, maybe what if I may have COVID or if it’s the COVID doing this to me.”*

Subtheme 2.3 lack of emotional support due to COVID-related visitor restrictions

Patients are reluctant to come to the hospital knowing that they will not be allowed to have the emotional support of visitors, due to restrictions in visiting hours because of the pandemic.

“And because of COVID-19, he can’t come visit me, so that’s also breaking his heart.”

Theme 3: financial strain during COVID-19 lockdown

The theme of financial strain delaying a patient’s presentation was recurrent. Many of these reasons were not related to the pandemic. However, the financial strain induced by the country’s lockdown regulations was specifically mentioned by one interviewee *“After this lockdown, my business is down and it’s difficult at the moment. We are under so much stress...”*

Non-COVID-19 related themes were also identified and may be broadly categorised as biomedical, practical, and emotional.

Discussion

During the COVID-19 pandemic it has become evident that patients with non-COVID-19 related medical emergencies delay their presentation to the EC [4,5,11,12]. A subgroup of particular concern is patients experiencing chest pain, since late presenters with myocardial infarction have a higher risk of complications [23].

We evaluated the reasons for delayed presentation by conducting a qualitative study using in-depth interviews. No African studies were found to compare our data with. Other international studies [14,24] propose that this delay is due to fear of contracting COVID-19 from the hospital. However the theme that was most prevalent in our study was that of uncertainty regarding COVID-19 hospital procedures.

To date, one comparative qualitative study was identified regarding patients presenting late with chest pain during the COVID-19 pandemic. It was conducted at a community hospital in California’s Central Valley [14]. Interviewers conducted ten telephonic and five in-person interviews. Five themes were established:

- Theme 1: Hospitals are seen as infectious reservoirs.
- Theme 2: Patients are not informed about the current risk-mitigation efforts at the hospital.
- Theme 3: Patients need confirmation from their doctors or health system about when to go to the ED.
- Theme 4: The national news focus on extreme cases skews local perceptions.
- Theme 5: In the setting of shelter-in-place, the most vulnerable patients are disconnected.

The investigators subsequently implemented the following structures into place which increased the number of patients presenting to their EC.

- Opportunity 1: Create a physical divide to create an emotional divide.
- Opportunity 2: Communicate clear and transparent information about services and risk.

The overarching theme found in our study was that patients were concerned about hospital protocols and whether they would be

permitted into facilities or not. This is similar to theme 3 from the Californian study which indicated that patients needed confirmation about when to go to the EC. The Californian study quotes an interviewee who wanted to receive an email or text from the hospital stating that “even if you don’t have the virus, but some other concerns, don’t hesitate to come in.” Similarly, four of our patients stated they were unsure about the procedures for non-COVID-19 complaints. “... Are we allowed to come? Will we be turned away or what is the situation?” “...maybe hospitals is not admitting at this stage because of the situation with COVID.”

Conversely, the overarching theme in the Californian study was that hospitals are seen as infectious reservoirs (theme 1). Patients reported that “the cons of getting COVID outweigh my normal health concerns.” This theme was also reflected in a case report from Kentucky, USA [24] titled ‘*The complication of late presenting STEMI due to the avoidance of medical care during the COVID-19 pandemic*’, the authors state that “patients are avoiding hospitals for fear of contracting severe acute respiratory syndrome coronavirus-2 (SARS COV-2)”. This contrasts with our study in which only one participant mentioned fear of contracting COVID-19. “Initially I was a bit scared, but then I asked a Christian friend of ours, does he think [name of hospital] is safe, can I go? ... He gave the green light.”

A reason for this difference could be that patients were initially fearful of COVID-19 but as lockdown levels improved, their fear dissipated. One patient’s statement supports this: “in the beginning I was very paranoid about the whole COVID thing. We stayed in the house those first 2-3 weeks, barely looked outside our windows, we were all very paranoid. And then it got easier and I realised I need to continue and work”. From this statement, it appears that the fear of contracting COVID-19 gradually decreased as the first wave of the pandemic subsided, and lockdown restrictions in South Africa were eased. The timing of our study may be a limitation since the interviews were conducted between the first and second wave of the pandemic in South Africa.

The opportunity to create a physical divide to create an emotional divide in the Californian study was a measure already in place at our two ECs. In both ECs, patients under investigation for COVID-19 (PUIs) and non-PUIs were clearly separated. This may also explain the lower levels of fear of contracting COVID-19 expressed by our participants.

There were differences in reasons for delayed presentation when comparing interviews from the private EC vs public EC in our study. The themes of emotional and financial factors were only expressed by patients presenting to the public EC. These patients reported subthemes such as fear of contracting COVID-19; fear of having COVID-19 and lack of emotional support due to COVID-19 related visitor restrictions. The financial implications of lockdown affected one patient who presented to the public EC. The only equally reflected theme in interviews between private and public patients was the uncertainty regarding COVID-19 hospital procedures.

The patient selection was based on purposive sampling directly before or after the researchers’ shifts in the EC, which is not a random selection. The purposive sampling was to identify information rich individuals in order to saturate themes and not to find a representative of the population.

The interviews were conducted between the first and second wave of COVID peaks in South Africa, when the number of patients with COVID-19 were relatively low. This may have decreased the level of fear of contracting COVID-19 from the hospital experienced by patients. This highlights the importance of changing perceptions during a pandemic.

Some of the interviews were conducted in Afrikaans based on language preference of the patient. It was subsequently translated into English by the researchers. This may have led to misinterpretation during the translation of data, however, the fact that patients are more likely to express themselves clearly in their preferred language, was considered to make them more likely to be information rich. Both researchers are proficient in both languages. This minimised the risk of misinterpretation.

Based on our findings, there is an urgent need for community reassurance and information sharing regarding hospital procedures during the COVID-19 pandemic. Communities need information outlets such as newspapers, social media, hospital information call-centres and word of mouth to explain proper hospital procedures during the pandemic. This may be done using infographics or leaflets as well as conducting radio interviews.

The authors designed an information leaflet which was posted on various hospital social media pages (see Appendix C). Client liaison officers of both hospitals were encouraged to reassure the public regarding the physical separation of COVID and non-COVID patients and communicate the correct procedure to follow when coming to the EC. The public were also encouraged to present early with life-threatening symptoms such as chest pain, stroke and after trauma.

The main finding of this study was that uncertainty regarding COVID-19 related hospital procedures was the predominant COVID-19 related theme for delayed presentation of patients with chest pain to the EC. In contrast to other studies, we did not find that the fear of contracting COVID-19 was a predominant theme. The timing of our interviews between the first and second wave of COVID-19 in Gauteng, most likely played a role in this finding. This highlights the importance of changing perceptions during a pandemic.

Communication with the public about the significance of important symptoms and the value of early presentation may help to decrease the number of late presenting patients during the subsequent COVID-19 waves, thereby improving patient care and minimising complications.

Credit authorship contribution statement

Authors contributed as follow to the conception or design of the work; the acquisition, analysis, or interpretation of data for the work; and drafting the work or revising it critically for important intellectual content: HD and KD contributed 30% each, and VL and AE contributed 20% each. All authors approved the version to be published and agree to be accountable for all aspects of the work.

Declaration of competing interest

The authors declare no conflict of interest.

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Dissemination of results

Results of the study will be disseminated to the institutions involved, and shared on various emergency medicine social media platforms, along with the patient information flyer (link embedded).

Appendix. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.afjem.2021.10.002>.

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