



Commentary

Managing acute abdominal pain in the emergency centre: Lessons from a patient's experience



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ABSTRACT

Pain is one of the most common reasons people present to the emergency centre with 7-10% of presentations being due to acute abdominal pain. However, pain is also often neglected by clinicians in emergency centres. The well validated South African Triage Score (SATS) incorporates pain assessment in the prioritising of patients with the aim of guiding clinicians. Based on the SATS, severe pain (a score of ≥ 8 out of 10) should prompt the clinician to initiate treatment within 10 min of presentation, as unmanaged pain has multiple negative consequences, including poor outcomes of the acute incident with delayed healing and increased risk of developing chronic pain. In this commentary, we present a patient's experience when attending an emergency centre for acute abdominal pain, describe relevant pain mechanisms and highlight the stages where clinical management could have been optimised.

African relevance

- Understanding pain as a biopsychosocial construct is essential for health care workers (HCW) to be effective.
- On the South African Triage Score, pain should be measured, and appropriate action taken based on the patient's report.
- Pain is influenced by culture and context. Pain needs to be assessed and treated with culturally relevant methods.

Acute abdominal pain is the primary reason for presentation in the emergency centre (EC) in 7-10% of cases [1]. Poorly managed acute pain has multiple negative consequences, including patient dissatisfaction and poor outcomes of the acute incident, such as delayed healing, and increased risk of developing chronic pain [2]. The definition of pain has recently been updated to ensure it aligns with a modern understanding of pain and expands on the complexity of this unpleasant sensory and emotional experience (Fig. 1).

This new definition of pain reminds clinicians that knowledge and understanding of nociception and the biopsychosocial factors that contribute to an experience of pain are vital for clinicians to deliver effective pain management. In other words, a mechanism-based approach is indicated with the clinician considering what physiological mechanisms in the peripheral nervous system, central nervous system, and associated systems may be contributing to the generation of pain [4]. In this context, here we present a case of a person with acute abdominal pain who presented to the emergency centre, and we provide input on how pain management could have been optimised.

Patient: I'm a 51 year-old physiotherapist and academic who specialises in pain management. I consider myself well educated and empowered; I have a PhD in pain and its management and teach pain management at an undergraduate and postgraduate level. And yet,

when I was patient in severe pain, I was no different to anyone else, I was vulnerable and felt completely disempowered. I am fit and healthy, and exercise at high intensity 5 or 6 days a week, training with a canoeing and surfski squad that includes several world medalists (including my own silver medal at the World Masters Canoe Marathon Championships in 2018). I was diagnosed with diverticulitis¹ 6 years ago when I developed severe left sided abdominal pain. In July 2020 things changed. On Friday night of 3 July 2020, I woke with left sided abdominal pain. This didn't surprise me, it's not unusual and I'd been uncomfortable all week which I blamed on diet. As usual, the sharp stabbing sensation would start in my left upper quadrant, ripple down to the left lower quadrant and into my pelvis. On Saturday morning I was lecturing on a course. As the day progressed the pain intensified, I took more Buscupan®, drank lots of water, breathed, and lay down during lunch....nothing helped and the pain got worse until at 3 pm when I had to admit defeat and stop teaching for fear of saying something unacceptable to the class!!

It is now after 3 pm on a Saturday afternoon during the COVID-19 pandemic, what do I do? I tried phoning my GP and the gastroenterologist I haven't seen for 6 years. No luck! I argued with my husband that I didn't need to go to hospital – we're in the middle of COVID lockdown, that's the worst place to be. I phoned my pain colleague and friend hoping she'd be on my side, but no, she agreed with my husband and so off to hospital we went. We arrived at the Emergency Centre of a large private hospital group at 4:30 pm. Step 1 – get in the door without my husband, register, try to stand up straight and not make strange noises. Step 2 – get seen by a triage nurse: “how bad is your pain?” she asks. “Well right now an 8/10 but when one of those spasms comes its 10!” I reply. No flicker of acknowledgement from her about my answer, she just writes it down. Takes my vitals, nothing unusual there I notice, which is

¹ Diverticulitis is a common condition where pouch-like protrusions of the colonic wall (diverticulae) become inflamed. Acute diverticulitis typically presents with abdominal pain, fever and leucocytosis. The clinical presentation, diagnostic procedures and treatment depend on the severity of inflammation.

“Pain is an unpleasant sensory and emotional experience associated with, or resembling that associated with, actual or potential tissue damage,”

Pain is always a personal experience that is influenced to varying degrees by biological, psychological, and social factors.

Pain and nociception* are different phenomena. Pain cannot be inferred solely from activity in sensory neurons.

Through their life experiences, individuals learn the concept of pain.

A person’s report of an experience as pain should be respected.

Although pain usually serves an adaptive role, it may have adverse effects on function and social and psychological well-being.

Verbal description is only one of several behaviours to express pain; inability to communicate does not negate the possibility that a human or a nonhuman animal experiences pain.

Fig. 1. The 2020 revised definition of pain include six key points to provide context and understanding on the definition of pain [3].

reassuring but also makes me feel like a wimp. If my temperature and blood pressure are normal, then I clearly don’t have an infection so why am I causing all the fuss? I think to myself. But then the pain hits again, so I’ll stay. Surely someone will see me soon and give me some decent analgesics and we can go home.

1. Triage procedure in the EC for a patient with acute abdominal pain

The patient appropriately presented to her nearest emergency centre for assessment. Appropriately, the patient was triaged. Triage is one of the central tenets of most emergency centres around South Africa, including those in the private sector, where it is widely used to aid clinical management and as a tool for billing purposes (although not the original intent) [5]. The South African Triage Score (SATS) [6] is now widely accepted and validated and is used in various forms across the continent [7–9]. The SATS is designed to be performed by a nurse, using an initial discriminator list of clinical symptoms and signs to calculate a score based on vital signs. This score classifies a patient to a colour category which dictates the urgency for them to be seen by a doctor. The reasons for this are clear as demonstrated in this case – vital signs alone (HR, RR, BP and temperature) are not sufficient for triage purposes. In fact, “severe pain” is clearly identified as a “Very Urgent” sign which immediately classifies a patient as Orange: to be seen within 10 min even without abnormal vital signs. “Moderate pain”, on the other hand, is an “Urgent” sign and dependent on vital signs that might categorise a patient as Yellow: to be seen within an hour. Of course, the caveat is that the otherwise clear and quantitative triage assessment tool does not go further into how to grade pain as moderate or severe. Several studies of triage performance have already identified that pain is a commonly missed discriminator; in fact Goldstein et al. suggest that triage nurses either lack the confidence to differentiate pain severity as mild, moderate or severe, or are perhaps “immune” to patients’ complaints of pain [10,11]. In this case, the patient presented with severe pain (pain greater than 7 on a pain scale of 0-10) and therefore should have been classified as Orange to be seen within 10 min by a doctor.

Patient: It’s now 6 pm and I’m sitting on a plastic chair in the waiting area with two other people scattered around the room. No one is allowed to sit with me, it’s COVID-times, and my husband is in the car. The pain is now cranking up regularly in speed and intensity, what I thought was a 10 was nothing on this! I’m trying to breathe, I’m trying to cope but I find myself bent over with my head on my knees gasping for air, swearing like a trooper and banging my fist against the chair with each spasm. I can hear the comments (“Daddy what’s wrong with that lady”) but I can’t do anything else. The receptionist is starting to sweat and calls the nurses – surely they can give me some analgesics? No, I hear them say, we can’t until she’s

been assessed and there are no beds right now. I hear all this, and I know I should argue but it’s taking all my energy just to stay in the chair. You know it’s getting bad when the receptionist sneaks over and offers you the paracetamol in her handbag, and then she apologises because she can’t even give you a hug! The background pain doesn’t drop to an 8 anymore, and it’s not localised anymore, my abdomen is in agony and then there is agony on top of agony.

The EC waiting room can be a high stress and chaotic environment for staff and patient alike, yet patient safety is heavily dependent on not only initial triage, but also regular reassessment of patients in the waiting room [12]. In this case, where the patient presented with severe pain, classifying as Orange on the SATS, assessment and reassessment of pain was indicated to evaluate and prompt evaluation of the mechanisms which may have been contributing to her pain [6]. Unmanaged pain with worsening severity is a concern, not only as a potential indicator of worsening pathology, but also as a contributor to poor outcomes due to the barrage of nociceptive stimuli sensitising the nervous system with impact on the immune, autonomic and endocrine systems, further worsening pain and having a negative impact on healing processes. Unmanaged acute pain can rapidly worsen as a consequence of sensitisation processes in both the peripheral and central nervous systems driven by neurogenic inflammation in the periphery, neuroimmune mediated inflammation in the spinal cord and patient anxiety leading to cortical upregulation [4]. All of these processes would have been present in this case (Fig. 2).

Patient: It’s now been two and a half hours and suddenly a nurse appears at my side and grabs my arm saying “come, come”. I shuffle after her, I can’t stand up straight, she points me to the hand sanitiser and then leads me to a bed. “Lie down”, she says, weirdly I worry about my shoes dirtying the sheets! She brings a drip set. At last, I think! I try to relax, I have to keep my knees bent to get some pain relief, I pull up my sleeve, oh dear I have terrible veins. She finds a vein in my hand and finally the drip is up. I look up and see, saline. Where is the analgesic I ask? No, she says, we can’t give you anything until you’ve been assessed but I wanted to get a line in so that as soon as they decide we can give it to you quickly. Thanks, I think, but really?! I watch patients coming in by ambulance going straight through for treatment and think to myself that we should have called them out rather than coming in ourselves!

Visceral pain can be diffuse, referring, and may be associated with autonomic responses such as nausea and vomiting [13]. Although not all viscera can evoke nociception (the nervous system process of encoding noxious stimuli), and thus pain (e.g. liver), other organs, including the colon, can elicit nociception both with and without tissue injury, e.g. in response to stretching of the tissues [13]. Ongoing nociception leads to peripheral sensitisation where the nociceptors’ firing threshold is reduced resulting in worsening pain and primary hyperalgesia as described in this case.

When pain is unmanaged, ongoing nociception from the periphery leads to spinal cord sensitisation with patients experiencing worse pain, pain referral, allodynia (pain from normally non-painful stimuli) and secondary hyperalgesia [14]. If there is a concomitant infective process, neuroimmune mechanisms may further contribute to this sensitisation.

Pain is a high order somatosensory construct of a conscious brain [15]. Multiple areas in the brain receive nociceptive signals with pain having affective, sensory, and motivational dimensions. Importantly, supraspinal processes can either enhance or inhibit nociception from the spinal cord, and thus contribute to pain severity [16]. Nociception (and thus pain) can be inhibited when patients feel secure and are reassured through brain activation of endogenous opioids [17]. Conversely, nociception can be enhanced when patients are anxious, feel threatened, have experienced trauma previously or are catastrophising by brain activation of cholecystokininergic systems [18–22].

With specific reference to this case, this patient likely felt anxious and threatened: her

Fig. 2. Mechanisms which contribute to visceral pain [13–22].

2. Management of acute abdominal pain

Decades of research and evidence give a clear voice to the fact that analgesia is an urgent requisite for the emergency management of moderate or severe abdominal pain which facilitates clinical examination [23,24]. The European Pain Federation algorithm for acute abdominal pain of ≥ 8 out of 10, suggests IV paracetamol and parenteral opioids for initial management, as soon as possible. The delay in initiating treatment in this case suggests that there may have been a misinterpretation of the patient's pain at triage leading to misclassification on the SATS, or a system issue preventing the patient being attended to "as soon as possible". Multiple contextual factors have been identified as affecting pain management in the ED, including cultural diversity [25], a lack of prioritisation of pain management within organisational systems, and a lack of education and training in pain [26]. During the COVID-19 pandemic, it may be that organisational systems, education and training focussed on managing patients presenting with respiratory distress and that pain had been implicitly deprioritised. When engaging with hospital management to try and understand why there was a delay in initiating treatment in this case, it was ascertained that the policy for pain management is to follow the WHO Stepwise Pain management ladder. Developed in 1986 with the primary goal of managing chronic cancer pain, the analgesic ladder has gone a long way to raising the profile of pain management and education, has been taken up for acute pain management, and has many strengths [27]. However, as highlighted by the authors of the Guidelines for the management of acute pain in emergency situations, the adoption of pain management guidelines alone are insufficient to result in a change in patient care [27]. In a well-resourced and specialist run Emergency Centre, we would recommend that the existing policy document for the management of pain (including acute abdominal pain) be coupled with regular education and training in pain management and a prioritisation of pain as a measurable outcome to impact patient care.

This patient's reflection that calling an ambulance would have resulted in faster and better treatment is a common one which has the potential to negatively impact ambulance service efficiency and capacity [28]. Several papers have documented the practice by the public of inappropriate calling of an ambulance based on the perception that the patient will jump the EC waiting room queue [29]. One of the reasons why people call ambulance services is a sense of urgency [30]. Clearly this patient presented to the EC because she perceived her pain as severe and the situation as needing urgent attention. The patient's feeling that there was a lack of urgency among the staff seems to have led her to believe that an ambulance would have been a better option [30]. If an ambulance had been requested, an appropriately qualified crew would have triaged the patient according to the SATS. And ideally, given the caveats referred to earlier that pain is often ignored, administered analgesia for severe pain according to their scope (Entonox® or intravenous (IV) morphine or ketamine (IV or intranasal (IN))). Encouragingly, new clinical practice guidelines for emergency medical services in South Africa, currently in implementation, may add additional analgesic agents [25]. Recent work suggests a lack of availability (or administration) of Entonox® for prehospital practitioners to manage pain, while prehospital advanced life support practitioners are reluctant to manage undiagnosed abdominal pain with morphine [31,32]. The reality is that this patient would likely not have received analgesia in the prehospital setting. The patient's perception that an ambulance would have been a better option highlights some of the systemic problems in prioritising patients, with ambulance delivered patients often perceived as "jumping the queue".

Patient: Finally, a doctor! "I can see you are in pain" – really?! I want to respond sarcastically. He asks for my history; he palpates my abdomen – which is still soft! "Right" he says, "we're going to sort your pain, take some bloods, do a Covid swab because I'm going to admit you, and then I want to send you for a scan because I think you

might have perforated your bowel". And this is the weird bit, I argued with him! How can I have perforated if my abdomen is so soft? Something in my brain was still processing, and the fear of a perforation was enough for me to push back. But the promise of pain relief was wonderful and within minutes the Perfalgan® was linked to my drip with a promise of opioids if that didn't make a difference. Phew, it's 7:30 pm and finally the pain is back where I can manage without curling up and gasping out swear words. Peace!

At this point, the appropriate analgesic regimen was initiated – IV paracetamol with opioid [24]. However, the treatment of pain could have been optimised through the use of non-pharmacological analgesia. Cognitive reassurance delivered using effective communication skills can significantly reduce pain [33] (REF). Based on the patient's narrative, it seems the clinician did not adequately validate the patient's suffering. In addition, the clinician did not seem to appreciate that delivering a message of "you might have perforated your bowel" would be interpreted as bad news, which may increase pain. Emergency medicine practitioners need to be proficient in effective communication skills, particularly with a focus on breaking bad news; however, these skills do not appear to have been utilised in this case. A pity, as communication which builds a therapeutic alliance with the patient is an effective pain management strategy, which activates endogenous analgesic pathways through a meaningful response [34].

Once the pain was managed, an examination of this patient would have included establishing the site of pain, fever, presence of other symptoms (diarrhoea, constipation, cystitis and the feeling of pelvic pressure) and blood tests to establish leucocytosis. CT scans are the imaging modality of choice, with excellent sensitivity (98%) and specificity (99%) [35,36], making this an appropriate part of the assessment.

Patient: Now to get some answers, 9 pm and off to the CT scan. Off the bed onto the scanner, for the first time someone notices that I can't straighten my legs and puts a cushion under my knees so I can lie down and relax. The scan is done and back we go to the EC and we wait, and wait, and wait. Midnight and we have an answer at last – yes, it seems I perforated my bowel and there is free air in my abdomen. But, it looks like the perforation has self-sealed. So, the plan for now, admission, IV antibiotics and continue with the relief of analgesics which have now been upped to IV Tramadol®. It's 12h30am when I get to the ward, send my husband a message and finally collapse asleep, the pain manageable as long as that drip keeps running!

3. Discussion

Acute abdominal pain is a common presentation in the EC. Its effective management should be facilitated by an effective triage system like the SATS. However, the SATS needs to be implemented with a systematic approach to assessing and responding to pain. Health care professionals need to be trained to obtain and interpret pain scores i.e., a pain score of 8 out of 10 is interpreted as severe and requires action. It is an ethical imperative to not only assess and document pain, but to also take action. Notwithstanding the pressures in the EC, effective pain management in the EC requires timeous implementation of both pharmacological and non-pharmacological (acknowledgement of pain, containment, explanation of procedure, etc) strategies and regular reassessment to stop the spiral of sensitisation leading to worse pain. Finally, a full assessment of the patient is *not* needed before initiating treatment for pain – delaying treatment often makes pain worse and assessment harder. In 2021, clinicians working in the prehospital setting need to prioritise pain assessment and management after the ABCs of resuscitation.

Dissemination of results

This paper will be shared with staff members at the Emergency Centre where events took place through an educational workshop.

Author contribution

Authors contributed as follows 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: RP contributed 40%, GB, PH, AL and MS contributed 15% each. All authors approved the version to be published and agreed to be accountable for all aspects of the work.

Declaration of competing interest

The authors declare no conflicts of interest.

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