Original Article

Prevalence, Location, and Characteristics of Chronic Pain in Intensive Care Survivors

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■ Abstract:

A growing number of studies have addressed the long-term consequences of intensive care unit (ICU) treatment, but few have studied the prevalence of chronic pain and pain characteristics longitudinally. The goal of the work described here was to investigate the prevalence and characteristics of chronic pain in ICU survivors 3 months and 1 year after ICU discharge and to identify risk factors for chronic pain 1 year after ICU discharge. The design used was an explorative and longitudinal study. The patients in this work had stayed > 48 hours in two mixed ICUs in Oslo University Hospital, a tertiary referral hospital. Patients completed a survey questionnaire 3 months and 1 year after ICU discharge. Pain was assessed using the Brief Pain Inventory–Short Form. At 3 months after discharge, 58 of 118 ICU survivors (49.2%) reported pain, and at 1 year after discharge, 34 of 89 survivors (38.2%) reported pain. The most common sites of pain at 3 months were the shoulder and abdomen; the shoulder remained the second most common site at 1 year. There was an increase in the interference of pain with daily life at 1 year. Possible risk factors for chronic pain at 1 year were increased severity of illness, organ failure, ventilator time > 12 days, and ICU length of stay > 15 days. The most common sites of pain were not linked to the admission diagnosis. These findings may enable health care providers to improve care and rehabilitation for this patient group.

Intensive care unit (ICU) patients are critically ill, and most require artificial ventilation or other organ support. Even though the ICU mortality rate is higher than the general hospital mortality rate, more than 80% of ICU patients in Norway survive their stay (Kvale & Flaatten, 2010). The review by Brinkman, Abu-Hanna, de Jonge, and de Keizer (2013) found that 76% of a general ICU population was alive 1 year after an ICU stay. Although research on long-term outcomes of ICU survivors has recently been increasing (Dowdy et al., 2005), the

main research topics have been health-related quality of life, posttraumatic stress disorder (PTSD), and cognitive disability (Griffiths, Fortune, Barber, & Young, 2007; Jones, Griffiths, Humphris, & Skirrow, 2001; Pandharipande et al., 2013; Timmers, Verhofstad, Moons, & Leenen, 2011). The majority of research on pain in ICU patients has focused on pain and pain relief during an ICU stay (Barr et al., 2013). Few studies have focused on persistent pain in these individuals (Battle, Lovett, & Hutchings, 2013; Boyle et al., 2004; Choi et al., 2014; Kong, Woon, & Yang, 2004), and even fewer have studied the risk factors for developing chronic pain (Battle et al., 2013).

The International Association for the Study of Pain (IASP, 2016) has defined pain as "an unpleasant sensory and emotional experience associated with actual or potential tissue damage." Chronic pain is defined as pain exceeding an average healing period of 3-6 months (Chanques & Jaber, 2007). Pain also contributes to anxiety, depression, disability, reduced quality of life, sleep disturbance, and financial burden (Leadly et al., 2014, Moore, Derry, Taylor, Straube, & Phillips, 2014, Park & Hughes, 2012).

Intensive care unit patients often experience pain during their ICU stay (Barr et al., 2013), and the severity of illness, damage to tissue, organ failure, the effect of being bedridden, and medical and nursing procedures may all be pain inducing (Chanques et al., 2007; Erstad et al., 2009; Payen et al., 2007). Previous studies of chronic pain among ICU survivors either are relatively old (Boyle et al., 2004; Kong et al., 2004), have a small sample size (Boyle et al., 2004), or are retrospective (Battle et al., 2013). From clinical practice, we know that much has changed in ICU treatment since 2004, for example, less use of sedation (Barr et al., 2013). Updated knowledge regarding the prevalence of pain, pain characteristics, and risk factors may enable easier identification of risk groups among ICU survivors and possibly prevent the development of chronic pain in such patients.

The aims of this explorative and longitudinal study were: (1) to investigate the prevalence and characteristics of chronic pain in ICU survivors at 3 months and 1 year after ICU discharge and (2) to identify the risk factors for chronic pain at 1 year after an ICU stay.

METHODS

This present study used an exploratory and longitudinal design. Three months after discharge from the ICU, patients were contacted by telephone, informed about the study, and asked whether they wanted to participate. After informed consent was obtained, data from their ICU stays were collected from their medical records. Survey data related to present pain and pain interference were collected at 3 and 12 months after discharge from the ICU. The study was conducted between May 2010 and January 2014. The study is registered in Clinical Trials: NCT02279212.

SETTINGS

Intensive care unit survivors from 2 mixed (ICU 1 and ICU 2) ICUs in Oslo University Hospital were included. This hospital is a tertiary referral hospital. ICU 1 has 11 beds, and ICU 2 has 9 beds. The two ICU wards do not treat trauma patients, but they treat all other surgical and medical critically ill patients (e.g., liver failure, severe respiratory failure, heart failure, and neurosurgical). The mean age of the population in both wards in the inclusion period was 56 years; patients in ICU 1 had a median length of stay (LOS) of 4.9 days, and those in ICU 2 had a median LOS of 2.5 days. The median ventilator time in the inclusion period was 3.9 days for ICU 1 and 1.6 days for ICU 2. The mean Simplified Acute Physiology Score (SAPS II) for ICUs 1 and 2 was 49.4 and 44.6, respectively (Nasjonalt Servicemiljø for Medisinske Kvalitetsregistre, 2017).

SAMPLE

Intensive care unit survivors aged 18 years or older who stayed in the ICU longer than 48 hours (thereby excluding the postoperative care patients) were asked to participate. The ICU survivors were required to read, write, and understand Norwegian to be able to complete the questionnaires. Patients with reduced cognitive function and terminally ill patients were excluded. Their level of cognitive function or the presence of terminal illness was evaluated with the assistance of the next of kin if the ICU survivor was unable to speak with the investigator (A.K.L.) on the phone. Of the 348 patients contacted, 193 consented to participate; 118 patients completed the questionnaire 3 months after discharge from ICU, and 89 patients completed it 1 year after ICU discharge (Fig. 1).

Data Collection

Severity of Disease in the ICU. The total sample was assessed by the first author (A.K.L.) using the SAPS II and the Sequential Organ Failure Assessment (SOFA) based on data from the first 24 hours of their ICU stay. SAPS II was originally developed to calculate the in-hospital mortality risk in ICU patients (Le Gall, Lemeshow, & Saulnier, 1993) and is valid and reliable in medical, surgical (Le Gall et al., 1993), and coronary (Schuster, Schuster, Ritschel, Wilts, & Bodmann, 1997)