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Editorial comment

Importance of early diagnosis of complex regional pain syndrome (CRPS-1 and C RPS-2): Delayed diagnosis of CRPS is a major problem

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In this issue of the *Scandinavian Journal of Pain* Lars Kristian Lunden, Inge Petter Kleggetveit, and Ellen Jørum publish an important retrospective analysis of patients with complex regional pain syndrome (CRPS-1 and CRPS-2) who had been referred for expert evaluation of chronic pain conditions [1]. Ellen Jørum's Section of Clinical Neurophysiology at the Department of Neurology of Oslo University Hospital, Rikshospitalet is a tertiary referral centre for a large part of South-Eastern Norway [1].

1. Lunden et al. [1] have two important messages to the readers

1.1. There is a lack of knowledge about CRPS and this delays diagnosis and treatment

Unfortunately, primary care physicians as well as hospital-based specialists still too often do not recognize a CRPS. This results in delayed diagnosis of CRPS and delays in appropriate treatment. The longer a CRPS lasts without helpful treatment, the more complex the pain condition becomes due to secondary complications. Treatment becomes even less effective when diagnosis is delayed. Normalization of functions and pain hypersensitivity of the CRPS-limb takes longer, at best. Some of these patients will suffer an intractable pain condition for many years. In their study Lunden et al. [1] found that mean time from injury until CRPS-diagnosis was almost 4 years, ranging from 0.5 to 10 years.

1.2. Exploratory surgery in CRPS is contraindicated

In a well-intended attempt to find a cause of the pain, patients with an unrecognized CRPS after an injury, or an operation, risk being exposed to exploratory surgery. Often this aggravates the CRPS-pain and cause more loss of function. In their review of 55 patients with CRPS, Lunden et al. [1] found that 27 patients had surgery for the pain condition or reoperation when an operation had precipitated the CRPS. A typical scenario is a sprained ankle that precipitates CRPS, followed by an ankle-arthroscopy with partial synovectomy – and subsequent a much worse pain in an ankle and foot that the patient cannot stand on. In their study, patients were operated from 0.5 to several years after the initial precipitating injury [1]. Twenty-two of the 27 patients (81%) had worse pain after surgery, only one had less pain after surgery. None of these 27 CRPS-patients were diagnosed with CRPS before their operation or reoperation [1].

2. CRPS is not a rare pain condition – so why is it not recognized?

A thorough epidemiological study from the Netherlands documented an incidence rate of 26 per 100,000 persons per year with a 95% confidence interval of 23–30 [2]. If this is true in Norway as well, we should have between 1000 and 1500 new cases of CRPS every year. Women are at least 3 times more likely to develop CRPS than men. Injury or surgery causes about 90%, whereas in 10% there is no known precipitating cause. Fractures are the most common inciting causes (almost half). The highest incidence was among females in the age group 61–70 years [2]. The prognosis is often better for CRPS after a fracture – around 75% being mostly pain free after one year (for references, see [3,4]). After 5 years, about 15% still have CRPS that is difficult to treat [4].

The reason diagnosis is not made early is that there is lack of knowledge about this enigmatic pain condition: Health care providers are as other people: We see only what we are looking for. Those who have not heard about CRPS, will not be able to recognize CRPS. Delayed diagnosis of CRPS is a problem in children as well [5].

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3. IASP-diagnostic criteria (for references see [6,7])

(1) The patient has **continuous pain**, often **disproportionate to any inciting event**
(2) Patient must report at least **1 symptom in 3** of the 4 categories below:
   i. **Sensory symptoms**: Patient reports hyperesthesia and/or allodynia
   ii. **Vasomotor symptoms**: Patient reports temperature asymmetry and/or skin colour-changes and/or colour asymmetry
   iii. **Sudomotor or oedema symptoms**: Patient reports oedema and/or sweating changes and/or sweating asymmetry
   iv. **Motor or trophic symptoms**: Patient reports decreased range of motion and/or motor dysfunction e.g. weakness, tremor, dystonia, and/or **trophic** changes in hair, nails, skin.
(3) Must show at least **1 sign in 2** or more of the following 4 categories:
   i. **Sensory signs**: hyperalgesia to pinprick, allodynia to light touch or joint movement
   ii. **Vasomotor signs**: temperature asymmetry or skin colour asymmetry
   iii. **Sudomotor or oedema signs**: oedema and/or sweating asymmetry
   iv. **Motor or trophic signs**: decreased range of motion, and/or muscle weakness, tremor, dystonia, and/or trophic changes of hair, nails, skin.
(4) **No other diagnosis** better explains the symptoms and signs.

4. There is no medical cure for CRPS. So why worry about delayed diagnosis?

Because we still do not fully understand the aetiology and pathogenic mechanisms of CRPS [6] there is no curative treatment [3]. CRPS-patients have pain that is often disproportionate to the precipitating cause, and functions of the limb deteriorate. They feel stigmatized by health care providers who do not believe that their pain condition is "real". It is clear that CRPS is not associated with preceding psychological problems, with somatisation, or with malingering [3]. However, even in psychologically sound persons who are unlucky enough to develop CRPS after trauma or surgery will experience psychological distress. They soon will be afraid of using the limb, pain on motion increases, and a number of socio-economic problems follow. Psychological problems are difficult to avoid when living with unexplained pain in a useless limb.

Early diagnosis and treatment can prevent these secondary complications of untreated CRPS-conditions. In the majority of patients, nature's healing processes can then go on so that normal and painless functions are restored in the limb [3,7].

5. Early diagnosis and the goals of early treatment

The main goal of treatment of CRPS is to reduce or prevent the secondary complications of CRPS. Patients with CRPS-1 or CRPS-2 are treated with the same approach, outcome being about the same.

5.1. Obviously mild cases

Obviously mild cases (e.g. after a wrist fracture) can be treated in primary care with physiotherapy focusing on restoration of function and with antihyperalgesic drugs (gabapentin or pregabalin). Paracetamol with or without codeine or tramadol may be helpful before physiotherapy. Potent opioids should be avoided.

5.2. The four pillars of treatment for complex regional pain syndrome of the 2012 UK-guidelines [3]

In the following we cite the abbreviated recommendations from the 2012 UK – NICE-guidelines [7] as summarized in [3].

5.2.1. Patient information and education [3]

This clearly is very important. Patients need to know as much as possible of the known facts about CRPS and what the goals of treatment are. Patients should be reassured that physical and occupational therapies are safe and appropriate. The full UK-guidelines from 2012 have a sample of a patient-information sheet [3,7]. At the Department of Pain Management and Research, at Oslo University Hospital has a similar information document in the Norwegian language.

5.2.2. Pain relief with medication and procedures [3]

No specific drugs are recommended because of lack of solid evidence, but drugs recommended for neuropathic pain may be considered, an up-dated guide for such drugs were recently published by Nanna B Finnerup et al. [8].

Spinal Cord Stimulation may be tried when other treatments have failed.

5.2.3. Physical and vocational rehabilitation [3]

Physical rehabilitation should be delivered by therapists competent in treating patients with chronic pain and CRPS. This is important. Emphasis should be on restoration of normal function and activities through acquisition of self-management skills, with patients and their families actively engaged in goal-setting.

Specialised techniques to address altered perception and awareness of the limb, e.g.:

- Self-administered desensitization with tactile and thermal stimuli
- Functional movement to improve motor control and limb position awareness
- Graded motor imagery, mirror visual feedback, mental visualization
- Management of CRPS-related dystonia

5.2.4. Psychological interventions [3]

Psychological intervention is based on individualized assessment, to identify and proactively manage any factors which may perpetuate pain or disability, or dependency including:

- Mood evaluation—management of anxiety and depression
- Internal factors, e.g. counter-productive behaviour patterns
- Any external influences or perverse incentives

This follows principles of cognitive behavioural therapy delivering:

- Coping skills and positive thought patterns
- Support for family and carers to manage their own needs and to maintain relationships.

6. Conclusions and implications of the Lunden and co-workers, study [1]

Complex regional pain syndrome in spite of advances in understanding aspects of the pathogenic mechanisms [4,6], remains an enigma, patients with CRPS and their carers experience a conundrum of symptoms and signs, therapies are mainly focused on relieving some of the symptoms and preventing exacerbations of the pain condition by secondary complications of physical and

psycho-social nature. The publication in this issue of the *Scandinavian Journal of Pain* by Lars Kristian Lunden, Inge Petter Kleggetveit and Ellen Jørum [1] is an important reminder that lack of knowledge about CRPS among professionals in primary and secondary health care is widespread in Norway. This causes delayed diagnosis and often un-helpful attempts to find a cause by doing surgery.

Their study, therefore, is an important wake-up call to do better. CRPS, even CRPS-2 with an obvious damage to a peripheral nerve, is not typical neuropathic pain. Still, the recently establish **National Centre of Competence in Neuropathic Pain** at the Department of Pain Management and Research, Oslo University Hospital, will have to focus also on acquisition and dispersion of knowledge about CRPS—about precipitating events, pathogenic mechanisms and treatment.

Conflict of interest

None declared.

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