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Psychomotor therapy as a treatment of chronic spinal pain: A qualitative study

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ABSTRACT

Objective: Psychomotor therapy is an innovative complementary approach that enhances the mind-body connection. It could have a positive effect on chronic pain syndromes but has not yet been specifically studied for spinal pain. We thus aimed to explore the experiences of chronic spinal pain patients with psychomotor therapy.

Design: We conducted a qualitative study using semi-structured interviews. 17 patients with chronic spinal pain were recruited from a multidisciplinary spinal pain program in a rehabilitation hospital in Switzerland. Participants received psychomotor therapy as part of this care. All interviews were transcribed and thematic analysis was performed.

Setting: Division of General Medical Rehabilitation, Geneva University Hospitals, Geneva, Switzerland.

Results: Four themes emerged from thematic analysis: 1) Connecting body and mind; 2) Passive individualized care; 3) Effect on mobility and well-being versus pain; and 4) Need for further care. Participants particularly appreciated the person-centered approach, relaxation and link between body and mind in the psychomotor therapy sessions. They shared positive effects of psychomotor therapy on mobility, kinesiophobia and overall well-being, rather than on pain. Finally, they would have liked more follow-up care at the end of the program.

Conclusions: Experiences reported by patients in this study suggest that psychomotor therapy could be a promising complementary therapy for chronic spinal pain within a biopsychosocial approach. To better understand the benefits of psychomotor therapy for chronic spinal pain, further research is needed and should consider patient-reported outcome measures such as well-being, fear-avoidance belief and disability.

1. Introduction

It is now commonly accepted that chronic spinal pain is the consequence of a complex interaction between biomechanical, psychosocial, environmental, genetic and cultural factors.¹ Guidelines recommend the use of multidisciplinary approaches in persons with high level of disability for several months² as a second line or adjunctive treatment.^{3,4} At the University Hospitals of Geneva in Switzerland, a multidisciplinary program for spinal pain has been developed and takes place over 8 weeks at a rate of 3–5 hours of treatment per week. Some of the treatments are group therapy (e.g. physical therapy, psychological support) while others are individual sessions (e.g. physical and occupational

therapy). However, the literature shows that even with multidisciplinary care, treatment effect is at best moderate for pain and function.⁵

Among multidisciplinary approaches, psychomotor therapy⁶ could be a promising complementary treatment for chronic spinal pain. At the crossroads of physical and psychological therapy, psychomotor therapy is an innovative approach that uses the body to serve the mind. Based on a biopsychosocial approach, it is a movement- and body-oriented therapy that uses techniques such as body awareness exercise, relaxation and sensorimotor exploration to foster the mind-body connection.^{6,7} The person is considered as a whole by including the physical, cognitive and emotional dimensions, as well as the psychosocial context.⁷ The specificity of psychomotor therapy is to emphasize personalized care

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centered on the lived body of both the patient and the therapist.

The term “psychomotor” was first introduced by W. Griesinger, a German psychiatrist, in 1844⁶ to describe the motor effects of psychological disorders.⁸ In France, the concept was then redefined by E. Dupré at the beginning of the 20th century and later developed by J. de Ajuriaguerra, G. Soubiran and others after the Second World War.^{6,8} J. de Ajuriaguerra and his team initially worked on psychomotor disorders in children by integrating theories drawn from developmental psychology and psychoanalysis.^{6,8} Parallel to the developments in France, concepts around psychomotor therapy also flourished in various European countries such as Belgium, Germany, the Netherlands and Switzerland.^{6,9} In order to promote and support psychomotor therapy across Europe, the European Forum of Psychomotricity (EFP) was founded in 1996.⁷ Psychomotor therapy is now a recognized profession and taught at the University level in Switzerland and other European countries.⁷ However, psychomotor therapy is still not well known in English-speaking countries⁶ and further research is needed to better understand and evaluate the effectiveness of this approach for different populations.^{6,10}

The field of application of psychomotor therapy has expanded with the years and it is now used, for instance, with adults suffering from psychiatric illnesses.⁶ It has been suggested that psychomotor therapy could also have a positive effect on chronic pain syndromes.^{11–13} For chronic pain syndromes, the effect of psychomotor therapy could be mediated by an increase in body awareness^{11,13} and feelings of self-efficacy.¹² Alternatively, it could decrease negative thoughts frequently related to body signals in these patients and hence decrease catastrophizing.¹⁴

Several studies have investigated the effect on pain of complementary and alternative therapies that enhance the mind-body connection, such as yoga,^{15,16} but few studies have been conducted on psychomotor therapy and chronic pain. To the best of our knowledge, psychomotor therapy for chronic spinal pain has never been examined. Furthermore, existing studies have primarily investigated the effect of psychomotor therapy using quantitative methods,^{12,13,17,18} and less attention has been paid to patients' lived experience and perceptions of psychomotor therapy. Yet, qualitative studies have proved to be useful to better understand the expectations and hopes of chronic low back pain patients regarding complementary and alternative medicine.^{19,20} In light of these limitations, we planned an exploratory qualitative research to investigate the experiences of chronic spinal pain patients with the utilization and the perceived value of psychomotor therapy.

2. Methods

2.1. Setting and sampling strategy

This qualitative research is an exploratory study on psychomotor therapy for patients suffering from chronic spinal pain. All procedures were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. The protocol was approved by the Central Ethics Committee of the Central Ethics Committee of Canton Geneva, Switzerland.

Participants were recruited from a rehabilitation hospital where they followed a 2 months multidisciplinary program for their chronic spinal pain and were offered psychomotor therapy as part of this care. Alongside psychomotor therapy, patients received physical therapy (stretching and strengthening exercises, exercises with fitness machines and exercises in a swimming pool in a group), occupational therapy (individual sessions tailored to the patient's needs) and psychological support (one weekly group session). Prior to the beginning of the program, patients received explanations on psychomotor therapy and were informed that they would be asked to participate in a study. Patients were first assessed by the psychomotor therapist to identify how they used and perceived their body. This initial observation took into account

their movement patterns, tone, coordination, balance, body schema, body image, spatial and temporal organization. The experienced therapist then used a standardized set of different media (dance therapy, therapeutic touch, relaxation techniques and sensorimotor games). These therapeutic tools were used according to the patient's needs. Participants followed individual and/or group sessions that lasted about 1 h each approximately once a week.

Patients were eligible for the study if they participated in the 2 months program and were excluded if they refused to receive psychomotor therapy or were unable to participate in an interview due to language problems, psychological disorders or cognitive deficits.

At the end of the 2 months program, a psychologist contacted the patients by telephone and asked them to participate in an interview on their experience of psychomotor therapy. 17 semi-structured interviews were conducted between June and November 2017. Informed written consent was obtained from all participants before interview.

2.2. Data collection

The interviews were conducted at the rehabilitation hospital by a psychologist (CV), trained in qualitative methods and not involved in patient care. Interviews lasted between 30 and 70 min. An interview guide was developed with a multidisciplinary team (a rheumatologist, a psychiatrist, a psychomotor therapist and 3 psychologists) and tested with a patient to ensure its adequacy. The guide included the following topics: general appreciation of psychomotor therapy, movement patterns, pleasure of movement, confidence in movement, body image and contribution of psychomotor therapy to the multidisciplinary care (appendix 1). Participants were first asked to share their experience of the psychomotor therapy then prompts were used to encourage them to develop their discourse following the interview guide.

All interviews were tape recorded, transcribed and anonymized. The interviewer listened to each recording to check transcripts for accuracy and get familiarized with the data. Field notes were also taken after each interview. As interviews were conducted in French, the quotes from the interviews were translated by the interviewer who is bilingual in French and English. Special attention has been paid to the translation in order to stay as close as possible to the meaning conveyed by the participants' words.

2.3. Data analysis

Two psychologists (CC; CV) who were not involved in the multidisciplinary program independently analyzed the transcripts of all interviews using thematic analysis methods.^{21,22} Following Braun and Clarke's phases of thematic analysis,²¹ they first closely and repeatedly read the interview transcripts to get familiarized with the data and note down initial ideas for coding. Analysis was performed throughout data collection, using paper and pencil, and enabled identification of recurrent themes and categories. Sampling ceased when no new categories emerged from transcript analysis.^{23,24} Saturation of data was obtained with 17 interviews. CC and CV discussed their findings and achieved consensus on a final thematic map. All interviews were then coded according to this thematic map, using Microsoft Excel spread sheets. Finally, the results of this analysis were debated with the multidisciplinary team in order to obtain a variety of perspectives on the data.²⁴ This use of triangulation by multiple healthcare professionals helped ensure the credibility of the final data by preventing “(...) the personal or disciplinary biases of a single researcher from excessively influencing the findings” (p.361).²⁴

3. Results

Among the 17 participants, there were 11 women and 6 men, with a mean age of 46.7 years (Table 1). The vast majority of participants suffered from low back pain (n = 15) and two suffered from full spinal

Table 1
Characteristics of participants.

Gender (woman/man)	11/6
Age (years; mean (SD); range)	46.7 (8.7; 32–62)
Education (n)	
Compulsory school	4
Professional degree	11
University	2
Occupation when last employed (n)	
Physical labor	7
Sedentary work	9
Physical + sedentary work	1
Employment status (n)	
Unemployed	6
Housewives	3
State support	2
Disability insurance	1
Sick leave	11
1-7 weeks	3
12-24 weeks	2
24 weeks-18 months	4
>18 months	2
Pain etiology (n)	
Low back pain	15
Full spinal pain (cervical, thoracic and lumbar)	2
Duration of pain (years; mean (SD); range)	7.7 (10.9; 1–43)
Total psychomotor therapy sessions (number; mean (SD))	6.8 (1.8)
Individual sessions (number; mean (SD))	4.5 (1.8)
Group sessions (number; mean (SD))	2.4 (2)

pain (cervical, thoracic and lumbar) (Table 1). Each person attended a mean of 6.8 individual and/or group psychomotor sessions (Table 1). Participant characteristics are detailed in Table 1.

Through the interviews, participants shared their experience and overall satisfaction of psychomotor therapy. The following 4 themes were identified with thematic analysis: 1) Connecting body and mind; 2) Passive individualised care; 3) Effect on mobility and well-being versus pain; and 4) Need for further care. Participants particularly appreciated the mind-body connection in psychomotor therapy and receiving a form of passive treatment. They reported positive effects of psychomotor therapy on mobility and overall well-being rather than on pain. Finally, participants wished to receive follow-up care at the end of psychomotor therapy and of the whole multidisciplinary program.

3.1. Connecting body and mind

A majority of participants appreciated the psychological aspect of psychomotor therapy. Regarding emotional expression, one patient described the individual sessions of psychomotor therapy as a place where she could “deposit her bag” and leave “feeling lighter” (Participant 2; woman; 33 years). It seems the psychomotor therapist managed to create a safe place where patients could express their difficulties and feelings without having their pain questioned. As illustrated in the quotation below, some participants further explained they particularly liked the link between the psychological and physical dimensions and that the therapist was not a psychologist.

“Above all, what psychomotor therapy brings is the psycho part. Because even if the specialist tries to look after our whole body, the motivation part remains, what we need when we have been in pain for so long and it’s chronic. And that has helped me a lot, and especially because it wasn’t like a psychologist, it was with the body.” (Participant 7; woman; 52 years)

This connection between body and mind was named by half of the participants and was seen as the specificity of psychomotor therapy. By linking soma and psyche, psychomotor therapy offered a holistic approach and a new perspective on pain for some patients.

“But with psychomotor therapy we make the connection, we make the connection. I think that the fact of looking after us as body and mind, it helps. Because with our illness, sometimes we become a bit, we have the sensation that we go to the doctors as a body.” (Participant 7; woman; 52 years)

“And also an awareness of what is pain in another way. I mean I think it’s interesting to always have different point of views on pain as it affects everything, it is extremely invasive (...)”. (Participant 17; woman; 55 years)

A few patients further shared that psychomotor therapy triggered changes in their body image. Regarding the more physical aspects of the therapy, over half of the participants also appreciated the sensorial exploration, in particular when done using spiky massage balls. These balls were used to stimulate tactile sensations and release muscle tension and pain.

“Those little massages that we did with the spiky balls on the back as well. Really, really good”. (Participant 13; woman; 51 years)

Finally, a few patients enjoyed how psychomotor therapy helped connect body and mind in a playful way. For instance, a participant shared her positive experience of a ball game that helped distract her from the pain during a psychomotor therapy session: “(...) after a very short period of time we didn’t think about anything else than the ball we were throwing. And that I thought was interesting because it’s, it’s not invasive as pain medication can be, there’s no harm for anyone”. (Participant 17; woman; 55 years)

3.2. Passive individualised care

Our findings suggest patients particularly appreciated psychomotor therapy for the passive care provided. Indeed, patients seem to have perceived psychomotor therapy, in particular the relaxation exercises, as a pleasant reward or a moment for oneself among other physically demanding therapies of the multidisciplinary program they were following.

“We need a moment of relaxation, because otherwise we do some physical exercise, we do, we talk in the group of, well I mean, we are, we are involved and it’s maybe this time where we are actually passive, [...] we are somewhat spectators of what’s happening and it feels so good.” (Participant 10; woman; 35 years)

One participant shared that with psychomotor therapy “(...) we recognize our body, we see it differently! It’s [psychomotor therapy] a place of relaxation for the body. Because X [name of the multidisciplinary program] is only hitting the body, hitting the body, hitting the body. Exercise, exercise, exercise, exercise. It feels as though we are taking part in the Olympic Games!” (Participant 16; man; 44 years)

Furthermore, participants especially enjoyed receiving individualized care in psychomotor therapy. It appears that the personal qualities of the therapist highlighted by patients, such as her listening skills, empathy, patient-centred approach, gentleness and non-judgemental attitude, participated to the feeling of being cared for. Talking about the psychomotor therapist during a group relaxation session, one woman said for instance: “Yeah, that she was there for me. And, by the way, I said it once because we laid down and she was giving us cushions, and she said: « Stay, I will bring you the cushions ». And I said: « Someone who looks after us ». It’s, it’s true, (...) and we came there for this moment of joy, we were blessed”. (Participant 13; woman; 51 years)

3.3. Effect on mobility and well-being versus pain

Through the interviews, participants mentioned positive effects of psychomotor therapy on their mobility and overall well-being, rather than on pain. Improved mobility seems to be mediated by less fear of movement, better coordination and flexibility. Approximately half of

patients shared indeed that they were less afraid to move because of the therapy.

“Well today I can open my arms, I’m more mobile, it’s also due to muscular strengthening, but with psychomotor therapy, I have the impression that it released my spirit. And it allowed me to dare. (...). Dare to move, dare to, to have less fear.” (Participant 8; woman; 38 years)

A few patients acknowledged as well improvements in motor coordination and flexibility with psychomotor therapy. As noted in the excerpt below, better mobility and coordination seems to lead to less disability.

“Movement coordination is really good, because it helps already to participate a bit to family life, to not be all thumbs.” (Participant 1; man; 51 years)

Among the different types of therapy proposed in the multidisciplinary program, participants more easily identified the effect of physical therapy on pain than with psychomotor therapy. Physical therapy was indeed cited as most helpful for their chronic pain rehabilitation. Physical therapy that used muscular strengthening exercises was seen as most effective, while physical therapy in a pool was appreciated for its possibility to let go and relax in the water. The following quotation illustrates well how a woman perceived the physical therapy sessions in the pool as helpful for her pain, and psychomotor therapy as helpful for her mobility and general well-being.

“What has changed a lot for me is the, is the, the strenght training with the pool, that helped me a lot for the pain. After, at the psychomotor therapy level, no I haven’t seen any difference, before doing it and after. It’s just that I had more mobility and felt better in my body in fact”. (Participant 6, woman, 40 years)

The effectiveness of psychomotor therapy appeared to be all the more difficult to evaluate because the therapy was gentle and passive. Indeed, some participants considered that the passive psychomotor therapy sessions were not as effective as the active and sometimes painful physical therapy. Thus, they seem to have perceived the painfulness of the physical therapy as a sign of effectiveness which coincides with the idea that with “no pain” there’s “no gain”. In the following interview excerpt, the participant compares the psychomotor therapy sessions with the physical therapy she received in the multidisciplinary program.

Participant 6: “We don’t realise because it’s done with gentleness. (...) but then after the counterpart is that we don’t know if our body has benefited from it or not, we don’t see the difference.”

Interviewer: “Whereas with the more physical sessions...”

Participant 6: “Well, there we see right away, the next day our back hurts, so we know that well: « It’s because I have worked hard on this part. That’s where it hurts ».” (laughs)

Interviewer: (laughs)

Participant 6: “And therefore, you know, it’s much more concrete and palpable. Whereas psychomotor therapy I think is much less palpable, concretely, regarding pain, it’s more that gentle side and soft mobility that changes in fact.” (Participant 6; woman; 40 years)

Lastly, participants found it difficult to evaluate the specific effect of psychomotor therapy on pain among the multidisciplinary care received.

“What has changed is to have less pain, in general. Now, the role psychomotor therapy plays in this, I don’t know.” (Participant 17; woman; 55 years)

For most patients, it appears as though psychomotor therapy contributed to the overall benefit of the multidisciplinary program for their spinal chronic pain.

“X [name of the multidisciplinary program] it’s really, as I already said, it’s all the therapists that did me good, it’s not just one, or just psychomotor therapy or occupational therapy, it’s really, it’s really all the people in fact” (Participant 6; woman; 40 years)

3.4. Need for further care

A majority of participants globally appreciated psychomotor therapy and wished for some follow-up care once the therapy was completed. For example, some would have liked a list of psychomotor therapists and/or a recording of the relaxation sessions to be able to continue this type of care at the end of the program. A few patients would also have wanted more psychomotor therapy sessions during the multidisciplinary program. In the quotation below, a man explains how he would like to continue benefiting from psychomotor therapy.

“It [psychomotor therapy] must not just stay like that during X [name of the multidisciplinary program] and then forget about it. Unfortunately, that type of thing you have to be able to exercise it in the long run, in the long run. And that’s what I would like to do and not just pass through this experience.” (Participant 12; man; 48 years)

The lack of follow-up care was not only felt for psychomotor therapy but for the whole spinal pain program. Indeed, patients particularly appreciated the professional acknowledgment of their pain and support provided by the multidisciplinary team during the program and regretted not getting further care after the two months program. Once the program finished, this caused two major reactions: anger, which drove patients to search alone for further help for their pain; distress, which led patients to feel abandoned and to experience depressive symptoms.

“There is a lack, there’s no follow-up after the program! We are, it’s up to us to find the solutions, let’s say the path to take after the program. And those who don’t find a path, they are always going to, they will return to their isolation, to their medicine, to bed, medicine, isolation.” (Participant 16; man; 44 years)

“And, psychologically, I felt good here. People, we chatted, we talked, we tried to find solutions. And there, it’s as if I was a bit abandoned. So even psychologically, it becomes very burdensome, very, very burdensome, to bear, but well.” (Participant 1; man; 51 years)

4. Discussion

The results of this study provide first insights into chronic spinal pain patients’ experience of psychomotor therapy. Indeed, to the best of our knowledge, this is the first qualitative exploration into psychomotor therapy addressed to patients suffering from chronic spinal pain. First of all, our results suggest patients appreciated psychomotor therapy for the psychological support received. Working on psychological aspects seems to have been less confronting with a psychomotor therapist than with a psychologist. The assumption psychomotor therapy works on the link between the body and mind could help to overcome the fear of not being taken seriously and of being said that “it’s all in your head” when addressing psychological difficulties. Several studies on persons with chronic back pain and other chronic pain syndromes have indeed shown this population suffer from the lack of visibility of their pain and struggle for credibility and legitimacy.^{25–28} Fear of the psychologization and delegitimation of their pain can even lead some patients to avoid sharing the psychological difficulties they experience.²⁵ In line with our

findings, a qualitative research on yoga for chronic low back pain highlighted the perceived psychological effects of this mind-body therapy in participants, such as improved mood, emotional self-regulation and sense of empowerment.¹⁵ In a multidisciplinary program for chronic pain, psychomotor therapy could thus support emotional expression and the feeling of being understood.

By connecting soma and psyche, this holistic approach seems to be perceived by patients as a way of linking together the different types of therapies of the multidisciplinary care and thus avoiding the feeling of being fragmented between therapies that focus either on the body or the mind.^{29,30} In this way, psychomotor therapy could provide patients with the sense of being considered as a whole and maximise the effectiveness of the different therapeutic approaches proposed in multidisciplinary programs for spinal pain.

Participants in our study recognized indeed psychomotor therapy as an integral part of the multidisciplinary care. More specifically, our findings suggest the passive psychomotor therapy sessions were particularly appreciated by patients because they counterbalanced the other demanding therapies of the program such as physical therapy. In multidisciplinary programs for spinal pain, a balance could thus be envisaged between active and passive treatments, or in other words between “being cared for” and “taking care of oneself” (self-management) to promote activity, decrease fear of movement as well as foster the mind-body connection in patients who often parallel this connection with a risk of delegitimation. Several qualitative studies have shown that self-management of chronic low back pain remains a challenge for patients^{31–33} and that the recognition of the importance of an active involvement in their treatment, instead of waiting for a “quick fix”, comes with experience and time.^{32,34}

Furthermore, our findings indicate that patients rather shared positive effects of psychomotor therapy on psychological and physical well-being, mobility and kinesiophobia, than on pain. In a similar way, a study on chronic low back pain patients seeking complementary and alternative medicine treatments revealed that their expectations regarding pain reduction was modest and that they expressed expectations in other domains such as function, physical fitness and well-being.²⁰ It seems as though treatment outcomes other than pain should be considered when evaluating complementary and alternative medicine treatments for chronic spinal pain.³⁵ In this way, the results of our qualitative research could be used to inform quantitative evaluation of psychomotor therapy. Patient-reported outcome measures could in particular concentrate on physical and mental well-being, fear-avoidance belief and disability to better understand the effect of psychomotor therapy for chronic spinal pain. According to a recent study on the effect of psychomotor therapy for chronic shoulder pain,¹⁸ further research could also assess changes in body awareness.

Finally, our study revealed that patients would have wished for further support to pursue psychomotor therapy and other care at the end of the multidisciplinary program. This lack of guidance after chronic pain rehabilitation has also been reported by patients in other studies.³⁶ Fu et al.³⁷ have recently identified maintaining long-term contact with health professionals as a facilitator for the self-management of chronic back pain. It thus seems important to reflect on how people suffering from chronic spinal pain can continue to benefit from such multidisciplinary programs once they have ended in order to avoid this feeling of post-program emptiness and encourage self-management. List of therapists (physiotherapist, occupational therapist, psychologist, psychomotor therapist, etc.) and existing peer support groups, written descriptions of personalised exercises, videos of physical exercises and audio recordings of relaxation sessions could for example be transmitted to patients upon program termination. Furthermore, the development of a website dedicated to chronic spinal pain with credible, readable and personalized information could be useful for the follow-up care of these patients.³⁸

4.1. Limitations

The participants in our study consisted of a selection of patients who were following a multidisciplinary program for their spinal pain in Switzerland, who accepted to follow psychomotor therapy sessions as part of this program and who accepted to be interviewed. Thus, a selection bias may have occurred and results may not be applicable to all chronic spinal pain patients. Hence the results may be limited in terms of transferability.³⁹ Furthermore, participants followed a variable number of individual or group sessions of psychomotor therapy according to their availabilities and needs, which could have had an impact on their experience of psychomotor therapy.

Another challenge encountered in the study was to focus patients on their experience of psychomotor therapy and not of the whole program. This points to the difficulty of comprehending the satisfaction and benefit of only one therapy among a multidisciplinary program. Finally, we cannot exclude that the appreciation of psychomotor therapy expressed by the participants was linked to the personal characteristics of the psychomotor therapist. Other experiences may thus be obtained with different styles of therapists.

4.2. Conclusions

The findings of our study provide the first qualitative insights into the experience of psychomotor therapy for chronic spinal pain patients. Within a multidisciplinary program, psychomotor therapy seems to help patients make the link between the physical and psychological approaches to pain. It could thus be a promising complementary therapy that goes beyond the traditional biomedical approach of chronic spinal pain. However, the evaluation of the therapeutic effectiveness of psychomotor therapy remains an important challenge¹⁰ and further research is needed to evaluate the effectiveness of this therapy for spinal pain. Instead of focusing on pain reduction, future studies could consider positive outcome measures on well-being, fear-avoidance belief and disability to better understand the benefits of psychomotor therapy.

CRediT authorship contribution statement

Claudia Véron: Methodology, Formal analysis, Investigation, Writing - original draft, Writing - review & editing. **Stéphane Genevay:** Conceptualization, Validation, Resources, Writing - review & editing, Supervision, Project administration, Funding acquisition. **Maud Knafou Bastard:** Resources, Validation, Writing - review & editing. **Adrien Fleury:** Conceptualization, Validation, Writing - review & editing, Funding acquisition. **Christine Cedraschi:** Conceptualization, Methodology, Formal analysis, Writing - review & editing, Supervision.

Declaration of Competing Interest

This study was supported by a grant from the Foundation of the Geneva University Hospitals. All authors declare no conflict of interest. All authors declare: no support from any organization for the submitted work; no financial relationships with any organizations that might have an interest in the submitted work in the previous three years, no other relationships or activities that could appear to have influenced the submitted work.

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Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:<https://doi.org/10.1016/j.ctim.2020.102590>.

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