

OPINION

Clinical practice in pelvic floor physiotherapy and COVID-19: a clinical commentary

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Abstract

Many physiotherapists have experience of working with the survivors of large-scale pandemics. The rehabilitation of functional deficits can include pelvic floor physiotherapy to decrease the bowel and bladder dysfunction that can be associated with a long illness. As more patients survive COVID-19, there is an increasing need for various forms of physiotherapy. Unfortunately, not much is known about the long-term side effects of this novel coronavirus. There is an abundance of literature about diseases with similar sequelae, and physiotherapists can learn and extrapolate treatment techniques from these sources. This article discusses what is currently known about the bowel and bladder sequelae of COVID-19, as well as the implications for further research and treatment in the field of pelvic floor physiotherapy. Physiotherapists can improve the quality of life of survivors of COVID-19 by screening for bowel and bladder dysfunction, as well as appropriately scaling exercise to improve their return to function.

Keywords: clinical practice, coronavirus, COVID-19, pandemic, pelvic floor physiotherapy.

Introduction

Medical professionals around the world have been struggling to treat patients who have contracted COVID-19. So little is known about this novel coronavirus and its after-effects that physicians and allied health professionals alike find it difficult to treat the sequelae. To that end, current research on similar side effects must be collated in order to create treatment algorithms that are appropriate for this patient population. This is true for traditional physiotherapy as well as its different specialties. Physiotherapists have responded to epidemics for many years, and as clinicians who have been at the forefront of rehabilitating patients who have survived pandemics, they will be an integral part of the multidisciplinary team (MDT) treating the survivors of COVID-19 as we move forward (Dean *et al.* 2020).

New symptoms of this coronavirus are still being discovered, and these should be considered by all members of the MDT. Pelvic floor

physiotherapists will be particularly interested to know that urinary frequency could be a sign of viral cystitis caused by COVID-19 (Mumm *et al.* 2020). Since the angiotensin-converting enzyme 2 (ACE2) is the primary receptor site for binding the virus, the organs susceptible to this catalysing protein are significantly affected. Side effects are most commonly seen in the lungs, intestines and kidneys, but the bladder is also affected by ACE2. Patients who exhibit signs of urosepsis without a positive culture may need to be screened for COVID-19. An increase in nocturia in individuals who later test positive for COVID-19 has also been demonstrated, and proinflammatory cytokines can sometimes be present in the urine (Lamb *et al.* 2020). Patients who present with a new onset of any of these symptoms may be appropriate subjects for COVID-19 testing. It will also be interesting to see whether there is an increase in persistent painful bladder syndrome after they recover: the mechanism for inflammation is the same in both disease processes.

Patients with pre-existing conditions will also have issues that could affect the outcome of physiotherapy. Physiotherapists who treat patients with inflammatory bowel diseases may have to

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discontinue these individuals' steroid or antibody treatments if they have a suspected infection, which will result in a flare-up of symptoms that may persist after they have recovered from the virus (León-Rendón *et al.* 2020). Some of the medications that patients with inflammatory bowel diseases are prescribed may protect them against COVID-19, and they should not change their general medical management out of fear of the increased risk of contracting it (Bezzio *et al.* 2020).

Another adverse effect of COVID-19 is that individuals may not be able to see their primary care physicians as quickly as usual, which can result in a delay in the diagnosis of bowel and bladder problems. The issues arising from this can range from the inability to perform a urinalysis for a common urinary tract infection to the life-threatening complications of failing to diagnose celiac disease in a child, which can result in permanent bowel damage (Catassi *et al.* 2020).

There are likely to be many lasting side effects of COVID-19 that will affect patients for years to come. What has been seen clinically, but not researched, is that some of the milder cases may not seek help for their ailments until much later because of the lack of correlation between their symptoms and their recovery from the coronavirus. Other sequelae are more clearly apparent shortly after recuperation, but continue to persist in "long haulers", i.e. those patients suffering from what has now come to be termed "long COVID". Researchers are attempting to determine how physiotherapists may be able to help to identify individuals who have recovered from the disease who may benefit from physiotherapy services, and devise proper treatment algorithms to maximize functional outcomes. It is necessary to review the available research, and compare it to known treatment methods for similar diseases.

COVID-19 affects multiple bodily systems to varying degrees. As musculoskeletal experts, physiotherapists are generally helping patients who survive it to return to functional activities. However, the adverse pulmonary side effects of the coronavirus mean that it can be challenging to use traditional forms of grading exercise with these patients because of the physical exertion involved. Physiotherapists must consider the extreme fatigue associated with surviving COVID-19. Patients may benefit from a more neurologically graded approach to strengthening and return to function.

Bowel and bladder function are both significantly affected by the respiratory complications

of the coronavirus. Patients can also experience the deconditioning that is associated with a stay in hospital, or the general fatigue reported by long haulers. While there has been little direct research into these individuals' pelvic floor complications and subsequent treatment, inferences can be made by correlating their symptoms with some of the more common neurological bowel and bladder sequelae experienced by those who have had other long-term diseases and associated stays in hospital.

Geriatrics

Elderly people were one of the first groups who appeared to contract COVID-19 at a higher rate than the general population. Unfortunately, even without the complication of the coronavirus, older adults tend to be more prone to deconditioning, fatigue, respiratory issues, and bowel and bladder complications. The need for social distancing, the reduction in therapy services and a decrease in activity as a result of virus precautions could be just as detrimental to this population as the virus itself (Vieira *et al.* 2020). Mobility issues often contribute to incontinence in this group. Restrictions in mobility caused by either social distancing or COVID-19-related fatigue can exacerbate existing pelvic floor muscle (PFM) weakness or create new sphincter deficiencies. It is paramount that physiotherapists who treat this population should not only encourage general movement, but also make sure that barriers to toileting are eliminated. The promotion of changes in and significant transitions between postures is essential for improving general strength and cardiovascular health (Vieira *et al.* 2020). These changes can also ensure that pelvic organ prolapse is not exacerbated by needlessly increasing intra-abdominal pressure.

If elderly patients are placed in an intensive care unit (ICU) for any length of time during treatment for COVID-19, they are put at high risk of ICU-acquired weakness (Özkeskin *et al.* 2020). This can take much longer to recover from than the usual weakness experienced after a virus such as influenza, and could cause PFM and diaphragmatic fatigue. This can have implications for both incontinence and constipation. Patients may experience increased urgency and frequency because of an inability to hold a PFM and external urinary sphincter contraction. They may also experience constipation as a result of a reduction in peristalsis, and a failure to bear down correctly because of diaphragmatic

weakness. Patients should be screened for bowel and bladder dysfunction after being discharged from an ICU. This will allow physiotherapists to initiate an early intervention, which will prevent these issues from causing secondary complications once they have returned home.

Respiratory complications

Stimulation of the ACE2 receptor can increase pulmonary vascular permeability, and this has been proposed as the primary cause of the respiratory complications that are associated with COVID-19 (León-Rendón *et al.* 2020). Approximately 15% of patients who contract the coronavirus will require oxygen therapy, and around 5% will require mechanical ventilation (WHO 2020), and may have lasting respiratory effects long after recovering from the virus. From a general physiotherapy standpoint, this can have implications for overall fatigue and the ability to tolerate physical activity. Physiotherapists will have to work closely with their respiratory colleagues in the MDT to determine the correct dosing and escalation of any cardiovascular exercise as patients undergo rehabilitation after recovering from the coronavirus.

The neurological impact that COVID-19 can have on the diaphragm (e.g. diaphragmatic myoclonus; Borroni *et al.* 2020) is of particular interest to physiotherapists. Patients may also experience ventilator-induced diaphragm dysfunction that may require further respiratory therapy or interventions even after the virus is gone, and this can have long-lasting effects on the patient's respiratory and bowel function (Guarracino *et al.* 2020). The diaphragm in ventilated patients unloads the respiratory muscles, causing progressive diaphragmatic weakness, which can persist long after the patient is removed from the breathing apparatus (Brosnahan *et al.* 2020). This can lead to PFM dysfunction because these muscles act synergistically during respiration and defecation. The diaphragm and the pelvic floor create a canister that relies on both muscles to create the proper pressure for respiratory and postural function (Gordon & Reed 2020). If the diaphragm is weak, this can have profound implications for the pelvic floor, and subsequently, cause bowel and bladder dysfunction.

Even mild or asymptomatic cases of COVID-19 present with reduced aerobic capacity and diaphragmatic endurance issues (Cramer *et al.* 2020). While these patients may not be referred to physiotherapy as quickly as those who have

been hospitalized, they may well need to undergo rehabilitation for pelvic floor and diaphragm weakness later. This suggests that there is a need for generalized PFME recommendations and better primary care screening in order to continue to make diagnoses of bowel and bladder dysfunction when this is still in its mild stages.

Post-intensive care unit syndrome

Patients who are admitted to an ICU for long periods of time can experience a variety of disabilities after discharge, including physical, cognitive and mental health issues (Ohtake *et al.* 2018). This is known as post-intensive care syndrome (PICS). These individuals often take longer to complete their rehabilitation after an illness, which can lead to a lower quality of life (Ohtake *et al.* 2018). From the standpoint of pelvic floor physiotherapy, the associated decrease in physical capacity can lead to incontinence and constipation. The cognitive issues can cause problems with remembering to use the toilet or sequencing, resulting in episodes of incontinence. Finally, mental health issues can contribute to anxiety, increasing the risk of overactive bladder symptoms. These problems are often seen in individuals who are suffering from neurological dysfunction, and they can be treated in a similar way to general pelvic floor patients. Timed voiding, sequencing and graded muscle strengthening are essential parts of the rehabilitation of patients with PICS.

Nutritional issues are among the most challenging complications for anyone who is hospitalized with COVID-19 (Arkin *et al.* 2020). Nearly half of patients admitted to an ICU with the coronavirus will have gastrointestinal hypomotility, and this leads to food intolerance and then constipation (Arkin *et al.* 2020). While these individuals are prescribed a high volume of sedatives and other medications, they are more susceptible to low motility than others who are critically ill (e.g. burn survivors). Furthermore, enteral nutrition may have to be stopped during prone treatment because of the risk of aspiration.

While nutritional services will be intimately involved with patients during their inpatient stay, they will also have to be followed closely after discharge because they will be at high risk of slow-transit constipation and dyssynergic defecation. Not only will these individuals have slow motility, but as a result of the lingering weakness common in cases of PICS, they will not be strong enough to generate sufficient intra-abdominal

pressure to evacuate their bowels completely. Pelvic floor physiotherapy should be considered for these patients in order to retrain both the endurance and coordination of their PFM.

General fatigue

COVID-19 attacks the ACE2 receptor, leading to an elevation in creatine kinase and lactate dehydrogenase in muscle tissue (Wang *et al.* 2020). These increases have been hypothesized by the above authors to be the reason for the muscular atrophy found in survivors of the coronavirus. Furthermore, the increase in thrombotic events, even those too small to be investigated, may contribute to a lack of blood flow to the muscles, which will result in muscle wasting (Wang *et al.* 2020). Musculoskeletal damage can have a variety of implications for pelvic floor function. The most obvious issue associated with muscle fatigue and damage is incontinence. Patients may find that they become progressively less able to respond promptly to urgency, and this can result in an increase in bladder accidents towards the end of the day.

Muscle fatigue also often results in decreased mobility, which can have implications for constipation in turn. Peristalsis may be reduced, causing a rise in slow-transit constipation in those who are fatigued. Low endurance can result in an inability to bear down effectively and for long enough to complete a bowel movement. Patients may have difficulty sitting with a good posture on the toilet because of fatigue in their trunk muscles. This can cause ineffective relaxation of the puborectalis muscle, which causes constipation as a result of dyssynergic defecation.

Patients with post-COVID-19 fatigue should be screened for pelvic floor issues. They will also need preventative education about timed voiding, bowel massage, and proper fluid and fibre intake. When prescribing exercises for this population, it is essential to allow for frequent rest breaks to avoid overfatiguing the muscles. Performing PFM exercises (PFMEs) in a gravity-eliminated position may prove to be beneficial by enabling muscle assistance and reducing fatigue. The relationship between the core musculature and breathing must be addressed early in order to help with toilet positioning, and produce downward pressure for bowel movements.

Telehealth

With the rise in COVID-19, physiotherapists in many countries were forced to turn to telehealth

in order to treat patients. One of the primary roles of physiotherapists is educating patients about disease processes and lifestyle modifications to improve general physical functioning. Telehealth is a resource that can be used for this when access to physiotherapy is lacking, and it is in the best interest of the patient (Lee 2020). There is not much evidence to support the efficacy of telehealth services in general physiotherapy, much less in specialty practice (Lee 2020). More quantifiable evidence in the field of pelvic floor telehealth may emerge as the social distancing required during this pandemic wears on, but that should not hinder the current effort to maintain patient access to these services.

Physiotherapists can provide education about fluid intake, timed voiding, positioning, fibre recommendations, and other lifestyle modifications for the management of bowel and bladder dysfunction. Pain neuroscience education is paramount in pelvic pain treatment, and multiple sessions with patients are required in order to discuss these principles of neurophysiology. Remote educational sessions could be highly effective for all such diagnoses. While physiotherapists are used to taking a hands-on approach, a patient's function must be emphasized first and foremost. This can be accomplished via telehealth, thereby minimizing time spent in the clinic. While there needs to be more education for physiotherapists on maximizing the ethical use of this technology, they should think outside the boundaries of traditional treatment in order to provide care for patients who are unable to attend sessions in person.

Implications for treatment

As individuals continue to reduce general physical activity as a result of lockdown restrictions, it will be necessary for physiotherapists to promote healthy exercise habits, especially among the vulnerable elderly population (Said *et al.* 2020). The promotion of home-based activities either in person or through telehealth is an opportunity for physiotherapists to help vulnerable communities to stay healthy and practise good habits. For pelvic floor specialists, education of the general population about incontinence and constipation prevention will be paramount.

The after-effects of COVID-19 can range from mild to profound. Research into the role of physiotherapy in the treatment of the various ailments experienced by survivors of the virus is ongoing. However, there is still little information

about the amount of time that it takes individuals to recover completely after surviving the coronavirus. Decreased scores for both maximal oxygen consumption and 6-min walk tests are still recorded in some patients as long as 6 months after they have recovered from COVID-19 (Rooney *et al.* 2020). Those who required mechanical ventilation can continue to experience effects even 12 months after recovery, which suggests that multiple physiological changes have taken place that may require rehabilitation (Rooney *et al.* 2020). Up to 27% of patients who survive the virus are left with chronic fatigue, which will impair traditional approaches to rehabilitation (Lam *et al.* 2009). These factors must be considered by physiotherapists who are devising a programme of rehabilitation for coronavirus survivors.

The evidence that has been published about the sequelae of COVID-19 suggests that pelvic floor physiotherapists should be an integral part of the MDT treating this population of patients (Rooney *et al.* 2020). For this reason, it will be necessary for them to make sure that the medical community is educated about the possible bowel and bladder implications of both the coronavirus, and the side effects of the medical therapies used to treat it. The physiotherapy community could also initiate screening measures in primary care offices and post-COVID-19 infection clinics. This would enable the prompt identification of issues such as constipation and worsening pelvic organ prolapse so that these patients could be referred for treatment much earlier (Box 1). Patients may think that incontinence or constipation is to be

expected after the coronavirus and cannot be corrected. It is up to physiotherapists to educate this population about the help that is available.

Several treatment methods already used by pelvic floor specialists can be incorporated into care plans for COVID-19 survivors. It has been suggested that increasing PFM strength may improve ventilatory drive and decrease feelings of shortness of breath (Gordon & Reed 2020). Both PFMEs and postural stability exercises should form the foundation of treatment regimens for these individuals, and physiotherapists are the experts when it comes to analysing the strength and movement of this group of muscles. Positioning a patient in a prone position while performing PFMEs can further reduce the burden on the respiratory muscles and improve diaphragmatic movement. As with the muscular strengthening techniques prescribed for those with neurological issues, patients must be given adequate periods of rest between performing postural exercises and PFMEs. External bracing may also be appropriate during defecation in order to reduce postural strain on the muscles, and allow patients to contract and relax their pelvic floor more efficiently on the toilet.

Physiotherapists need to keep up to date with the research that is being conducted with COVID-19 survivors. There is an opportunity for pelvic health specialists to be involved in the studies of exercise dosage and appropriate musculoskeletal treatments for this population. In order to achieve full functional recovery, they should be an integral part of the MDT treating these patients.

Box 1. Screening questions

Do you experience leakage of urine at any time during the day?	<ul style="list-style-type: none"> ● If yes, for daytime, pelvic health physiotherapy may be appropriate ● If night-time only, other physiological causes may need to be ruled out first
Do you have any issues initiating the flow of urine?	<ul style="list-style-type: none"> ● If yes, a urology consultation may be needed first ● Pelvic floor physiotherapy may also be appropriate
Do you experience any leakage of stool?	<ul style="list-style-type: none"> ● If yes, referral to pelvic floor physiotherapy may be appropriate
Do you strain excessively during bowel movements?	<ul style="list-style-type: none"> ● If yes, referral to pelvic floor physiotherapy may be appropriate
Do you experience any pain with urination, defecation or penetration?	<ul style="list-style-type: none"> ● If yes, a medical referral is indicated first ● Once cleared medically, pelvic floor physiotherapy for the patient may be appropriate

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