COVID-19 and Osteoarthritis Disability: Possible Impact on Premature Mortality, and Excess Morbidity and Preventive Strategies

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Abstract

Older adults who already have chronically painful disabling osteoarthritis of one or more joints, which is the most common musculoskeletal disease affecting the older people. may also be more susceptible than healthy age and gender matched adults to infections such as COVID-19 as a result of their debilitated state and oftentimes comorbid health conditions such as diabetes, heart disease and asthma. This piece discusses this topic and offers some directives focused on disability and fatality prevention among osteoarthritis sufferers and other older adults and younger at risk adults.

Keywords: Coronavirus • COVID-19 • Infection • Mortality • Osteoarthritis • Prevention

Introduction

Adults who are elderly or obese or both, along with those who have one or more comorbid health conditions, are more likely than not to be at increased risk for Coronavirus 19 [COVID-19] [1,2], a novel corona virus that can currently prove fatal. They are possibly also at heightened risk for experiencing increasing symptoms of the widespread disease disabler, known as osteoarthritis, due to the presence of any emergent or prevailing or persistent increases in depression, anxiety and the inability to pursue health promoting behaviours due to the multiple restrictive legal features of the pandemic and its impact on social interactions, physical and mental health, plus movement access outdoors. Those older adults who already have chronically painful disabling osteoarthritis of one or more joints, which is the most common musculoskeletal disease affecting older people may also be more susceptible than healthy age and gender matched adults to infections as a result of their debilitated state and oftentimes comorbid health conditions such as diabetes, heart disease, and asthma [3].

Health providers, on the other hand, normally able to consult with this group, may currently be overwhelmed by the demands of treating acutely ill patients, and thus less able to help those with one or more chronic health challenges or risks effectively, either in the context of primary prevention or secondary and tertiary prevention approaches. Older adults with osteoarthritis, even if cared for continuously by providers, may not be able to obtain services deemed non-essential such as physical therapy via home or office visits, rehabilitation or exercise classes, occupational therapy, or face to face counselling, among other desirable forms of intervention, if they are at high risk-or may put themselves at high risk, since the providers may already be infected with the virus, even though asymptomatic.

At the same time, those older as well as younger adults who already have severe osteoarthritis of one or more joints, especially the hip or knee joints, hand, and spinal joints, and who are likely to be relatively immobile and housebound, as well as obese, may be especially at risk for acquiring COVID-19, along with multiple additional challenges in managing their joint disease, as a result of having minimal help, either formal or informal due to relatives/others being restricted from interacting with the individual. They may have potential problems with basic activities such as having to wash hands frequently, don masks and gloves, retrieve food or medicines or both, from the exterior, for example, they may not be able to lift, bend, or carry, clean packages, and open them, while coping with the fear of contracting COVID-19, among other added daily challenges, and especially if they have already contracted this virus and are in isolation.

In addition, surgery as a tertiary remedy for those with severe osteoarthritis pain, while somewhat successful, now poses further added risks of intrinsic as well as acquired infections, and further debility, as well as delays, due to its oftentimes elective nature.

As well, although physical activity, which is highly promoted for health maintenance in the older age groups, regardless of disease status, may be especially challenging to undertake by those numerous populations of older people who are now home bound. As well, left on their without support or provider inputs, they may be highly uncertain about exercising safely in a constrained environment. In addition, they may also not be familiar with technology that might be helpful, and even if they are, may not have the financial resources to make use of available modes of assistance such as 'yoga' on line, and other related programs such as 'food and drug' delivery.

In regards to basic commodities, even if this group can venture outside, they may still not be able to get up at 6am or 7am if they are stiff and sore from their arthritis, nor able to stand in line ups for basic necessities. Moreover, many live alone or are dependent on ambulatory devices that may evoke displeasure by the public in the confines of a store for example. Public transport, and transport for older disabled persons is also potentially risky even if available.

We feel that while much is being correctly devoted to combating COVID-19, the individual who is already vulnerable, should have all the resources and support necessary to maximize their health. This is not only humane and ethical practice, but has far-reaching public health ramifications, as chronic osteoarthritis affects the majority of the elderly population, and those who are most vulnerable to the virus are those with the more severe forms, and multiple comorbid conditions found to parallel this disease.

In this regard, we especially agree with Kim and Su [4] about applying a biopsychosocial model approach to address issues such as those highlighted above, and would like to offer an additional few thoughts that may help older adults living in the community guidance towards the steps that can be taken to maintain sufficient wellbeing and the ability to recover if they are found to be positive for the Corona virus, and/or to maximize their health, in efforts to minimize their risk of fatal exposure, and need for extended care or hospitalization.

Based on the literature and the past work of the author, the following three preventive thematic areas have been selected for highlighting in this brief, where the focus is on helping community dwelling adults take control of their situation, while reducing the burden on primary care practitioners needed in the front lines, as well as the goals of reducing suffering and excess debility, plus premature mortality. These strategies encompass activities to promote and foster:

- Nutrition
- Pain control
- Social support

The overarching and key theme of these strategies is however, prevention, not only because prevention is better than a cure, but the

only approach at present for averting a potentially fatal incurable health condition such as COVID-19. In this respect, the importance of elder health cannot be underestimated, and every effort, including primary as well as secondary and tertiary prevention efforts aimed at offsetting both excess physical disability, as well as enhancing physical and mental health, is arguably more likely than not to reduce the chances of acquiring severe illness, an increased risk of infection, and dependency, as well as premature morbidity and death. While the themes highlighted below are clearly not all encompassing, they are possible among the most practical strategies that can be applied at a population level, as well as a local level.

Nutrition

Good sound nutritional intake is a prerequisite for the maintenance of optimal health, regardless of health status. Indeed, as can be determined from the fact that in almost all 'lock down' policies, precedence has been given to maintaining the food supply chain and availability, and to some degree to safe food preparation and storage. Aid in the form of nutrition is increasingly common-over and above other societal interventions to alleviate distress and further ill health of populations.

Yet, more needs to be done here given the fact that even if one can access food in theory, the food supply chain may be compromised, and access to desired food may not be automatically assumed in the current context of COVID-19, for many reasons. Moreover, even if available, it may be quite challenging for people with painful osteoarthritis to prepare meals, especially in light of the care needed currently in food preparation, such as careful washing or cleansing of all food sources, packaging etc

As explained above, the ability to shop for healthy foods, even if available, may also be limited physically as well as financially, while food storage may pose an additional problem, as may the safety and quality of food delivery if care is not taken to ensure the meals are nutritious and prepared with great care.

Fruit and vegetable intake, increasingly found to be particular import here, as may dietary supplements, and which may indeed have a possible favourable impact on the Immune system [5,6], in addition to musculoskeletal benefits, such as bone health [7] may not be readily available to all.

According to Grant et al. [6] case-fatality rates increase with age as well as with chronic disease comorbidity, both of which are associated with lower vitamin D concentrations. People with osteoarthritis may thus be deficient in vitamin D, and susceptible to infection, among other disabling conditions, such as bone fractures. To reduce the risk of infection, especially among those at risk for low vitamin D levels, Grant et al. [6] recommend taking 10,000 IU/d of vitamin D3 for a few weeks to rapidly raise vitamin D concentrations, followed by 5000 IU/d, if indicated. According to these authors, the goal should be to raise vitamin D concentrations above 40-60 ng/mL (100-150 nmol/L). In addition, for the treatment of those cases that become infected with COVID-19, higher vitamin D3 doses might be useful.

At the same time, in addition to vitamin D, we recognize the value of other supplements, such as vitamin C and E, and do not exclude other supplements that might be helpful such as Omega-3 [8,9]. In addition, it appears that focusing on weight loss in the obese adult or osteoarthritis patient, along with the promotion and maintenance of a healthy weight is of great importance to maximizing health status, and in preventing excess infection and disability risk [10,11]. Excessive weight loss, which is a risk factor for fracturing a bone, should also be avoided at all costs, given the negative implications of this type of injury as regards COVID-19 [12].

Pain Control

Pain is common among the elderly, especially those with one of more osteoarthritis joints, and comorbid illnesses [13,14]. In addition, pain due to respiratory dysfunction in responses to COVID-19 may be expected to heighten the pain experience. Without adequate control, efforts to undertake physical activity, an important factor in reducing risk of exposure to harmful infectious agents, or in aiding recovery, along with sleep health, and mental health may subsequently be severely compromised.

Unfortunately, pain, the most important symptom in osteoarthritis [13], and one that could modify disease resistance, is not easy to ameliorate without considerable careful thought and effort due to its complex nature. In particular, physicians who may be able to help under normal conditions are currently strained to the brink in efforts to control the contagion of Corona virus 19 versus providing care [15]. At the same time, some commonplace painkillers have been found to perhaps be contra indicated in terms of their impact on heightening COVID-19 risk [12].

A variety of additional factors associated with COVID-19 that may compound the pain experience of the older adult include factors such as-poor food choices due to availability, or preference for unhealthy food, malnutrition, weight gain due to decreased activities, excessive weight loss due to fear, pain, anxiety, and limited health services, depression, anxiety, and fear that reduces sleep quality and that can provoke further pain, and a cycle of disability that undermines the immune system.

While mindfulness meditation, acceptance therapy, and QiJong approaches that minimize depressive symptoms and anxiety, may be especially helpful, these approaches alone may not suffice, and even if they do, may require educational support and individualized directives to be effective and may not be useful for all populations. Exercise too, especially recommended in this realm [16,17] as it may favorably influence energy homeostasis, while promoting an anti-inflammatory environment, and neuroprotection [18] and immune processes [19] and pain must also be carried out carefully among older adults with chronic health conditions and frailty symptoms to avoid doing more harm than good. To this end therefore, careful instruction, resources, and fostering motivation should not be neglected [20]. Adequate sleep, also essential for limiting pain should be encouraged.

Social Support

Social support refers to the use of feedback strategies, direct assistance, passive assistance, and emotional support and informational support-all factors that link to health status in a manner that may be helpful or harmful to an individual if absent or applied inappropriately. Social capital is the ability to call on multiple forms of support as needed or desired,

This assistance can prevail in the form of tangible support as required for feeding, washing, and hygiene as indicated or needed, and on an individualized basis, bearing in mind the need for safety and distancing and personal preferences and beliefs.

As well, social connections that can promote positive health attributes, such as modelling, plus adherence to recommended health regimens, while keeping a safe distance are likely to prove helpful as outlined by Xiao et al. [21]. The appropriate provision of tangible items as well as informational items, plus emotional support can potentially foster a more favourable outcome than not that the absence of needed and desired support, which can prove harmful mentally, as well as physically.

In particular, linking 'at risk' older adults who are isolated with others like them via online support groups or blogs, the use of periodic telephone calls made by supportive others, and social media may be extremely helpful as well, as may a community network of tangible support provisions.

Discussion

Although little is known about the virus, it appears COVID-19 is more likely to affect the older adult with multiple health challenges in a fatal manner than the healthy older person or younger person. Since many older adults are currently afflicted with painful disabling osteoarthritis, along with one or more comorbid health conditions, and a proclivity to fractures, this group is likely to be at high risk for infection and premature mortality.

Although no papers were found on a recent search concerning osteoarthritis and COVID-19, past efforts in the realm of osteoarthritis care, as well as current health recommendations imply that to offset this risk a concerted effort should be implemented now, rather than later on, in light of the failure to cure either osteoarthritis or COVID-19 illness.

In addition to the discourse above, and in light of the possible loss of access to care by vulnerable adults due to unaffordable insurance costs in the face of work losses, and other unanticipated costs of the epidemic, it appears reasonable to advocate that both health providers, and the community members themselves proactively take and agree to assume dual responsibility for remaining community members as opposed to requiring support in institutions or hospitals.

Those who are male, and those in the higher age ranges who are most vulnerable are strongly encouraged to remain as healthy as possible, especially if they already have osteoarthritis and one or more comorbid health conditions, such as asthma, heart disease, and cancer being treated

Table 1: Home Based Strategies Providers Can Foster.

• Advice and understandable, accessible and practical educational tools
• Periodic telephone/online discussions/check-ins
• Emails as indicated
• Encouragement, empathy, and careful listening
• Meals on wheels
• Protocol guidelines for reducing risky behaviors and excess pain
• Information and resources as indicated to reduce barriers to protective behaviors
• Communications that reinforce favorable self-efficacy beliefs and expectations
• Information on the importance of maintaining a healthy weight [10] and diet
• Ideas that can minimize environmental risk factors
• Ideas that help to allay fears and promote sleep health [24]
• Appropriate information on the use of vitamin D and other supplements [5,6]

Table 2: Home Based Strategies Community Dwelling Adults Can Safely Attempt.

• Educated decisions about healthy/versus unhealthy choices
• Meditation related practices
• Guided imagery
• Self-education
• Mild to moderate exercise participation [2,25]
• Controlled breathing practices
• Sound nutritional practices
• Recommended supplements
• Gardening or outdoor exposure as permitted
• Use if appropriate assistive devices
• Joining a support group
• Practicing social distancing, hand washing
• Helping to minimize environmental risk factors
• Adopting optimal sleep routines [24]

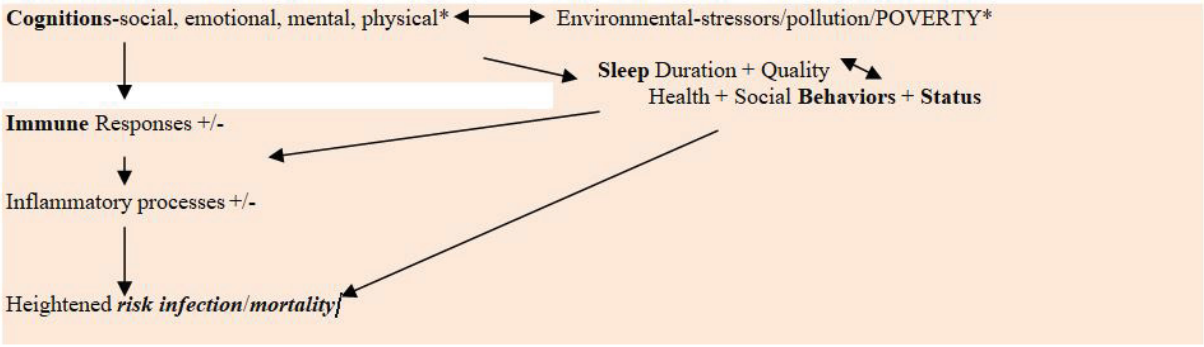

Figure 1. Conceptual Model of Possible Modifiable Factors Linked to Excess COVID-19 Risk. *Attributes that can be mobilized for prevention purposes [6,10,19,21-30].

with immunosuppressives.

To carefully assist in this process, the formal health care provider may want to bear in mind the above three highlighted features, and the importance of physical and mental health promotion in their efforts to foster optimal outcomes. As outlined in Table 1, the provision of the above mentioned strategies may prove efficacious.

At the same time, community dwelling older adults, including those who are disease free, are encouraged to be active in efforts to maintain or improve their health in conjunction with their providers efforts by employing strategies highlighted in Table 2.

In the meantime, we agree with Zhang et al. [5], all potential interventions to strengthen the wellbeing of older adults, especially those with osteoarthritis and comorbid conditions, as well as those to prevent these from occurring should be forthcoming, to ameliorate current, as well as huge numbers of future older adults with excessive chronically disabling joint problems. The possible importance of vitamin D should not be overlooked. The hypothetical model above highlights the co-existing cognitive and behavioral linkages that this author believes should be borne in mind in terms of advocating for improved prevention against the risk of COVID 19 in older community dwellers, especially those with osteoarthritis of one or more joints. The use of health promoting tactics rather than fear based messages should be forthcoming as well. The overall goal of one or more interventions noted above and others is to prevent disability excess due to osteoarthritis, and fatality due to superposition of COVID-19 or its independent impact on disablement [22].

Conclusion

The magnitude of potentially preventable suffering among the elderly in the context of COVID-19 is clearly immense, despite a lack of focus or any strong evidence base on this issue at present. As outlined by Gasmi et al. [22] and until some curative remedy emerges, the importance or reducing health risks through the use of dietary, nutritional, medical, lifestyle, and environmental approaches, together with the proper relevant risk management strategies, is possibly the most sensible way to deal with the current COVID-19 pandemic, in general. The same sentiments must surely apply to those older adults as well as younger adults with disabling osteoarthritis, especially those with comorbid conditions, if a major health related disaster is to be averted from becoming a catastrophic one in the future. When considering what we know and what can be done to stem the tide of excess mortality currently seen worldwide in vulnerable adult populations, the data imply that the ideas as outlined in Figure 1 may be more helpful than not to reflect upon in the context of prevention at all levels and clinicians and researchers are strongly encouraged to foster supportive or competing evidence in this regard in efforts to limit the immense consequences for society at the individual and economic and social levels.

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