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Impact of Coronavirus Disease 2019 (Covid-19) Outbreak on Rehabilitation Services and Physical Medicine and Rehabilitation (PM&R) Physicians' Activities: Perspectives from the Spanish Experience.

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COVID-19 outbreak is a major threat now in Europe. After Italy, Spain is the most affected country by large. Unfortunately, at this time (4/4/2020) the Spanish Government reports 11,744 deaths, 124,736 confirmed cases and 34,219 recovered cases. 57,612 patients require inpatient care and 6,416 of them are located in intensive care unit (ICU) at this moment(1). The impact in the health care system is thus enormous and obviously includes PM&R services around the country.

We read with great interest the article from Boldrini, *et al.*(2) on the impact of the outbreak in rehabilitation services in Italy. As our Italian colleagues point out, the pandemic outbreak has also triggered an entire re-shaping of the Rehab services around Spain. In fact, in most general hospitals, a great number of rehabilitation professionals have been reassigned to emergency rooms joining multi-professional as well as multi-specialist acute care teams working with hospitalized patients. Our physical medicine and rehabilitation facilities have been transformed into makeshift inpatient wards. At the same time, rehabilitation patient treatments priorities and professional/patient protection guidelines have been set following similar principles as the ones described in the aforementioned paper. In fact, The Spanish Society of Physical Medicine and Rehabilitation (SERMEF) quickly published online (16/3/2020) several recommendations at the beginning of the severe movement restriction forced by Spanish Authorities(3).

At this very moment in the rehabilitation arena in Spain great concerns are at stake:

1. To provide rehabilitation treatment for the Post-Intensive Care Syndrome (PICS), which appears to show some distinct features such as sustained respiratory impairment due to pulmonary fibrosis. It is still early to evaluate it, but for sure the particularities of the new COVID-19 related PICS would be in very few weeks better defined. Most probably it will add functional challenges to the patients, which rehabilitation professionals will have to deal with.
2. To keep the more adequate rehabilitation treatment to those patients in need during the outbreak and movement restriction measures. Our role selecting those patients is crucial, not only to provide them with the rehabilitation procedures that are highly necessary to prevent loss of functionality but also to avoid patients being unnecessary exposed to the virus. This is a main concern and it requires that all rehabilitation professionals be fully involved in comprehensive assessment and follow-up in order to provide the better patient-centered solutions in this extreme situation.

3. Tightly related to the previous concerns is the protection of the professionals and patients. In Spain, professionals have mostly followed the World Health Organization recommendations(4), adapted to every setting. Unfortunately, in some settings such as nursing homes, access to Personal Protective Equipment (PPE) is very scarce and it has brought devastating consequences in elderly patients. Besides quick diagnosis tests are also of limited availability and reserved to patients with symptoms requiring hospital medical attention. Thus at this time the real prevalence of the disease in our population is not known.
4. The specific stressors, not only physically but emotionally that the health professionals are exposed and can have a mid/long term impact of the psychological well being of health professionals in PRM.
5. Finally, but not least important, the great concern relies on the rehabilitation discipline activity after the outbreak. We will have not only to deal with the COVID-19 patient treatment but with the huge group of rehab patients with rehabilitation needs after an unavoidable stop or intensity decrease of their therapies. The consequences of this latter situation are still to be evaluated, but it is easily predictable that the impact in the overall patient function will be deep. At the same time we cannot disregard the psychosocial impact of the huge disruption of the economical system in our countries. The Organisation for Economic Co-operation and Development (OECD) has predicted a GDP descent of about 25% in advanced and emerging economies. In Spain it could reach almost 30%(5). Thus, unemployment and financial tensions will lead to poorer families and patients, namely an additional social and emotional distress which will surely affect our task and outcomes.

National and International medical societies have a key role in providing responses to new problems and crises. In SERMEF we are still convinced that XXI century is the one of Rehabilitation. Present crises reinforce that feeling because its consequences affect all the aspects of human function. Several actions should be urgently backed from our institutions:

1. Reinforce the academic and training contents of rehabilitation physicians and related professionals in the specific area of Internal Medicine and most specifically PICS assessment and treatment.

2. Provide resources to launch research projects related to the assessment of specific and overall impact of present pandemic in rehabilitation field.
3. To transmit to policy makers and other stakeholders the paramount importance of allocating resources to strengthen the Rehabilitation services in order to implement several crucial points:
 - a. Expansion of the use of new technologies such as tele-rehabilitation, wearable assessment devices and other resources in all settings. At this emergency they have been of great help in those settings where they were available, in the future they could be money saving.
 - b. Promote the transition to real multi-professional rehabilitation teams to truly apply a patient-centered approach in a bio-psycho-social model, thus rising the proportion of professionals that can help in boosting the technology applicability (bioengineers) and, most importantly, in dealing with more robustness with the psychosocial aspects of the rehab patients (psychologists and social workers among others).
 - c. Integrate the rehabilitation services in all the levels of care from home care, primary care, acute care, sub-acute care, convalescence and nursing homes; to make it more efficient.

We are living difficult times all over Europe. Our continent is facing a deep, challenging crises that will probably change our history. For sure, strenuous efforts shall have to be done by all of us to keep and restore the welfare of our fellow citizens. In fact, welfare is highly linked to maximal function and participation of each individual (two of our main objectives). Thus, It is the time that all rehabilitation professionals around Europe struggle to achieve such a precious quest.

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