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Multicomponent Rehabilitation After COVID-19 for Nursing Home Residents

In March 2020, the World Health Organization declared the coronavirus disease 19 (COVID-19) outbreak a global pandemic. Nursing homes were particularly struck by the COVID-19 outbreak, with some authors considering the COVID-19 pandemic as the “ground zero” for these structures.[1] Increasing literature has shown that the consequences of COVID-19 in older people may include malnutrition, sarcopenia, bedridden syndrome, and finally mortality.[2] Nutritional suggestions are therefore important in older people previously affected by COVID-19.[3] The use of oral nutritional supplements in patients with or recovering from COVID-19, particularly if sarcopenia is present, is also suggested.[4] In the case of acute sarcopenia after COVID-19, oral nutritional supplements shall provide ≥400 kcal/d including ≥30 g protein/d and shall be continued for at least 1 month.[5] Even if COVID-19 is a common condition in nursing homes, studies reporting data on the effect of nutritional supplementation in the residents previously affected by COVID-19 are still not available. Therefore, the aim of this study is to report our experience in nursing home residents previously affected by COVID-19 using a nutritional supplementation program together with rehabilitative indications.

This research was conducted in Villa Althea, Spinea, Venice and included residents previously affected by COVID-19. The study was performed between November 2020 and January 2021, within 3 days from the naso-pharingeal swab testing negative. The follow-up period was 30 days. To all the participants, a physical rehabilitation program, supervised by trained physiotherapists, was given. Briefly, this program consists of several gradual steps, from positioning the guest sitting at the edge of the bed, resuming control of the trunk where possible, to sit on a suitable aid as early as possible for at least a couple of hours a day on the first day, to retrain in posture transitions in an active or assisted way, as soon as possible. For residents who walked before COVID-19 phase or were able to perform therapeutic gait, the physiotherapists proposed other tasks such as work for the reacquisition of the upright position with therapeutic verticalizations, pace training, and reacquisition of therapeutic gait in a protected environment in the gym and

Table 1
Follow-up and Baseline Data of Activities of Daily Living, Mobility, and Risk of Pressure Sores in Nursing Home Residents, Previously Affected by COVID-19

	Baseline (n = 28)	30 d (n = 28)	*P* Value
Age, y, mean (SD); range	87.8 (7.3); 69-101		—
Female gender, n (%)	24 (85.7)		—
Days after COVID-19 diagnosis, mean (SD); range	20 (7.1); 10-30		—
Barthel Index			
Activities of daily living*	53.7 (6.0)	45.3 (7.9)	<.001
Feeding*	7.1 (2.6)	4.1 (3.0)	<.001
Bathing*	4.7 (0.7)	4.0 (1.0)	.001
Grooming*	4.6 (0.5)	3.5 (1.2)	<.001
Dressing*	8.7 (1.4)	7.3 (1.8)	<.001
Bowels*	9.3 (1.2)	8.3 (1.3)	<.001
Bladder*	9.4 (0.9)	8.5 (0.9)	<.001
Toilet use	9.9 (0.5)	9.5 (0.9)	.02
Mobility*	38.7 (2.4)	34.8 (5.3)	<.001
Transfers*	14.0 (1.4)	12.2 (3.1)	<.001
Mobility*	14.7 (1.5)	12.5 (2.7)	<.001
Stairs*	10	10	—
Total score	92.4 (7.6)	80.0 (12.3)	<.001
Exton-Smith scale			
General condition†	2.6 (0.6)	3.3 (0.5)	<.001
Mental status†	2.9 (0.5)	3.2 (0.4)	.004
Activity†	1.0 (0.1)	2.0 (0.0)	<.001
Mobility†	2.1 (0.7)	2.9 (0.8)	<.001
Incontinence†	1.00	1.00	—
Total score†	9.7 (1.5)	12.4 (1.3)	<.001

Unless otherwise noted, data are reported as absolute numbers with their standard deviations.

*For Barthel Index, including the single items, higher values indicated higher grade of disability.

†For Exton-Smith scale, including the single items, higher values indicated better performance.

subsequently recovery, for those who were able, of a functional gait with aid, assistance, and/or supervision within the nucleus. This program was given at least 3 times weekly in all residents involved in the study.

A multicomponent nutritional supplementation with a 220-mL drink containing 1.5 g of calcium HMB (β-hydroxy-β-methylbutyrate) and 500 IU of vitamin D_3 was administered once daily. The presence of disability was assessed using the Barthel Index and its 2 main domains, that is, Barthel activities of daily living and mobility.[6] The risk of pressure scores was assessed using the Exton-Smith scale.[7] The differences between baseline and 30-day evaluation were calculated using a pairwise Student *t* test. A $P < .05$ was deemed statistically significant. Analyses were performed using SPSS software, 21.0 version.

Overall, as shown in Table 1, 28 nursing home residents (mean age: 87.8 ± 7.3 years, 85.7% females) were followed-up for 30 days. The mean Barthel Index, in terms of activities of daily living (53.7 ± 6.0 vs 45.3 ± 7.9; $P < .001$), mobility (38.7 ± 2.4 vs 34.8 ± 5.3; $P < .001$), and total score (92.4 ± 7.6 vs 80.0 ± 12.3; $P < .001$) significantly improved between the 30 days and the basal evaluation. As shown in Table 1, all the items included in the Barthel Index significantly improved between the 2 assessments, except the ability of lifting the scales. Similarly, the risk of pressure sores was significantly reduced between the 2 evaluations (9.7 ± 1.5 vs 12.4 ± 1.3; $P < .001$). The compliance was overall high (85% took the supplementation everyday), and no severe adverse effects were observed.

In this exploratory study including 28 very old nursing home residents, a multicomponent nutritional supplementation (associated with a physical rehabilitation program) significantly improved disability and reduced the risk of pressure sores, after 30 days of treatment. Even if both sarcopenia and COVID-19 infection are particularly relevant in the nursing home setting, to our knowledge, this is the first study exploring the effect of a multicomponent intervention in this kind of patients. As expected, after COVID-19 infection, our residents were practically bedridden and with a high risk of pressure. Bed rest, in fact, is traditionally prescribed in patients with COVID-19 in order to minimize the metabolic demand and orientate resources toward the recovery process.[8] However, it has been evidenced that long periods of immobilization and rest produce a negative impact in older people.[8] Therefore, after COVID-19 infection, nutritional and physical rehabilitation programs are mandatory.[9] However, direct evidence of the positive effects of nutritional and physical rehabilitation programs are very limited. To our knowledge, only a recent small randomized controlled trial in 33 older people previously affected by COVID-19 and mainly admitted in intensive care unit suggested that adults surviving COVID-19 improved their functional status after 8 days of therapeutic exercise.[10] Our study, even if a control group was not present, further confirmed the positive effect of nutritional and rehabilitation programs in older people previously affected by COVID-19.

In conclusion, a multicomponent nutritional supplementation containing HMB and physical rehabilitation were able to significantly improve disability and reducing the risk of pressure sores in very old nursing home residents previously affected by COVID-19, indicating the need for early intervention in these patients to reduce the risk of negative consequences of sarcopenia.

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