COVID-19's Mortality for Elderly People

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A prevalência da pandemia COVID-19 (SARS-CoV-2) na população idosa, principalmente institucionalizada, ocorre por ser este o cenário em que o isolamento social é difícil em uma situação como a de uma pandemia. A vulnerabilidade dessa população está ligada aos aspectos fisiológicos do envelhecimento, que impactam na eficácia do sistema imunológico, desencadeando morbimortalidade por doenças infecciosas.

Keywords: SARS-CoV-2 ; COVID-19 ; non-communicable chronic diseases (NCCDs) ; clinical features ; institutionalized or hospitalized elderly ; meta-analysis

1. Introduction

In this way, aging has become a global phenomenon in full exponential growth, showing the success of public health and socioeconomic development policies. However, there are new challenges for society that this presents. Our society needs to adapt to this new scenario, maximize the functional capacity and health of the elderly and promote their social inclusion and safe participation. [1]. In view of this, there are social consequences of the aging population and new public health issues arising that affect European countries, such as Italy, in particular [2]. In Italy, the profile of the elderly population is of a group with a high prevalence of non-communicable chronic diseases (NCCDs) and associated comorbidities [1]. In Italy, aging is a common and growing phenomenon. Italy is considered the country with the second largest number of elderly people [2], along with a mortality rate that has decreased by more than 50% in the last 30 years, mainly due to the reduction in cardiovascular diseases [3].

The COVID-19 pandemic (SARS-CoV-2) has caused considerable mortality in populations considered at risk, such as the elderly population, especially those who are institutionalized, a scenario in which social isolation is difficult in a situation such as a pandemic. The vulnerability of this population is linked with the physiological aspects of aging, which impact the effectiveness of the immune system, triggering morbidity and mortality from infectious diseases [4].

Thus, it is necessary to investigate the main factors that make institutionalized elderly people more vulnerable to death. Fragility is a condition that worsens with advancing age and with COVID-19 infection, especially for the hospitalized elderly, who tend to develop a more accentuated presentation of the classic symptoms of the disease [5].

The objective of this study was to synthesize the factors associated with the mortality of elderly Italian people diagnosed with coronavirus who lived in institutions or who were hospitalized because of the disease.

2. Current Findings

The main morbidities presented by the elderly in the studies were: dementia [6], diabetes [7][8], chronic kidney disease [7] and hypertension [8], showing that NCCDs had a key role to play in these cases.

Table 2 shows the descriptive analysis of the quantitative variables according to the survivors and non-survivors, and **Table 3** shows the effect size, in SDM and 95% CI, of the variables affecting mortality.

Table 2. Descriptive analysis of quantitative variables, according to groups of survivors and non-survivors.

Variables	Non-Survivors			Survivors		
	N	Mean	SD	N	Mean	SD
Age (years)						
Iacarinno et al. (2020)	**188**	**79.6**	**0.8**	**1304**	**64.7**	**0.4**
Stroppa et al. (2020)	**9**	**74.44**	**7.21**	**16**	**68.38**	**10.16**

Variables	Non-Survivors			Survivors		
	N	Mean	SD	N	Mean	SD
Bonetti et al. (2020)	70	75.4	14.99	74	62.63	14.97
Charlson Index						
Iacarinno et al. (2020)	188	4.37	0.14	1403	2.63	0.05

N, sample size in each group; SD, standard deviation.

Table 3. Meta-analysis of factors (quantitative variables) associated with mortality.

Variables	SMD (95% CI)	I^2	Z	p-Value
Age (years)	3.10 (2.79; 3.40)	99.9%	19.76	<0.001
Charlson Index	1.74 (1.56; 1.92)	-	19.33	<0.001

SMD, standardized mean difference; Z, Z statistic of the meta-analysis; I^2, I-square; 95% CI, 95% confidence interval.

Table 5. Meta-analysis of factors associated (quantitative variables) with mortality.

Variables	RR (95% CI)	I^2	Z	p-Value
Male	0.98 (0.67; 1.43)	89.3	0.10	0.919
Chronic diseases	1.20 (0.94; 1.54)	-	1.48	0.139
Cancer	1.60 (0.60; 4.23)	-	0.92	0.356
Diabetes	1.90 (1.53; 2.37)	62.7	5.73	<0.001
Cardiovascular diseases/coronary artery disease	1.80 (0.85; 3.80)	92.0	1.53	0.125
COPD [1]	2.19 (1.54; 3.10)	0.0	4.39	<0.001
Immunodeficiencies	5.28 (0.26; 108.12)	-	1.08	0.280
Chronic kidney disease	3.96 (2.65; 5.91)	0.0	6.73	<0.001
Metabolic disease	1.51 (0.60;3.75)	-	0.89	0.374
Obesity	1.28 (0.78; 2.10)	60.8	0.99	0.322
Hypertension	1.37 (1.24; 1.51)	69.3	6.25	<0.001
FH [2]	3.27 (2.49; 4.29)	-	8.55	<0.001
Dementia	3.67 (2.43; 5.55)	-	6.17	<0.001
Smoking	0.74 (0.32;1.71)	-	0.70	0.483

[1] Chronic obstructive pulmonary disease (COPD). [2] Familial hypercholesterolemia (FH). RR, relative risk; Z, Z statistic of meta-analysis; I^2, I-square; 95% CI, 95% confidence interval.

Table 4 shows the descriptive analysis of qualitative variables according to the survivors and non-survivors, and **Table 5** shows the effect size, in RR and 95% CI, of the variables affecting mortality.

The analysis of quantitative variables showed that the risk of mortality was higher in individuals with diabetes (RR, 1.90; 95% CI, 1.53; 2.37), COPD (RR, 2.19; 95% CI, 1.54; 3.10), chronic kidney disease (RR, 3.96; 95% CI, 2.65; 5.91), hypertension (RR, 1.37; 95% CI, 1.24; 1.51), FH (RR, 3.27; 95% CI, 2.49; 4.29) or dementia (RR, 3.67; 95% CI, 2.43; 5.55) (**Table 4**).

3. Current Insights

The data show that diabetes, chronic obstructive pulmonary disease, hypertension and dementia were morbidities that considerably increased the risk of death in the elderly. This association is presumed to be related to the high prevalence of these diseases in the elderly population [9].

The Instituto Nazionale di Statistica (ISTAT) of Italy, in its 4 May 2020 report, states that the impact of COVID-19 is greater in people with extremely compromised health conditions, causing the mortality of these people to occur in a shorter time. The document also reports that, in some cases, COVID-19 may not be the leading cause of death, but a contributing factor to overall mortality [7]. There are a series of phenomena and dynamics that affect the current state of health of Italians, such as the aging of the population, the increase in risk factors (including NCCDs), “the phenomenon of vaccination hesitation, the threat of antimicrobial resistance, the difficulties of access to innovation, the shortage of doctors, the lack of regional homogeneity and the delay in digitizing the health system that affect the system as a whole” [10].

Italy has the lowest prevalence rate, by age, for chronic obstructive pulmonary disease and cardiovascular diseases [10]. This may be fortunate as these were the diseases that increased mortality among the elderly in the articles analyzed. This link is supported by a review that described the association between cardiovascular diseases and an increased risk of complications from COVID-19 [11].

On the other hand, the country has the highest prevalence rate, by age, for dementia. As aging progresses, the risk of this diagnosis increases. It is a progressive neurodegenerative syndrome characterized by a cognitive decline that limits social functions and activities of daily living [12]. In addition to having an important impact on the quality of life of these people, dementia was also shown to be a risk factor for mortality in elderly people with COVID-19.

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