



The Current Situation of Morbidity and Mortality in Covid-19 Positive Patients of The General Teaching Hospital "Ambato"

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Article History	Abstract
Received: 01 May 2023 Revised: 05 August 2023 Accepted: 11 August 2023	<p>All sectors of society have been involved in the health emergency, which as of January 2020, the WHO cataloged a new pandemic, discovering a new viral agent called SARS-CoV-2, producing the disease COVID-19, a multifactorial disease with a different etiology in each patient but with marked pictures of; severe acute respiratory distress syndrome with community-acquired pneumonia and thromboembolic complications, in addition to having more serious complications in elderly patients and with the presence of comorbidities. Currently in Ecuador, to date 801,180 positive cases and 35,040 deaths have been reported. To give a specific focus on morbidity and mortality in the city of Ambato, the research developed a qualitative analytical, descriptive and cross-sectional method, giving a perspective through statistics with the report of positive cases described in the city, the variation in age of the patients, their associated comorbidities, complications during their stay in the COVID-19 area of the Ambato General Teaching Hospital and the report of deaths, these data duly specified in the hospital records and detailed through figures and tabulations that expose the reality of COVID-19. 19 in the city of Ambato.</p>
CC License CC-BY-NC-SA 4.0	Keywords: Morbidity and mortality, Records, Covid-19

1. Introduction

The global pandemic that was unleashed throughout the world affected daily activities and paralyzed the different systems that run day by day in society, since since December 31, 2019, the Municipal Health and Sanitation Commission of Wuhan (Hubei province, China) reported a cluster of 27 cases of pneumonia of unknown etiology. Days after the first outbreaks it had an exponential growth cataloging it since January 7, 2020 as a health crisis. Chinese authorities identified a new type of virus of the *Coronaviridae* family, which was named SARS-CoV-2 that causes COVID-19 disease, as a causative agent of the outbreak. On January 30, 2020, the World Health Organization declared the outbreak of SARS-COV-2 in China a Public Health Emergency of International Concern (4).

This type of pathogen comes from the family in which the average incubation period is 5-6 days, with a range of 1 to 14 days. Among the first manifestations of the virus, are what; in more than 80% of the primary infected, symptoms were mild (fever, cough, expectoration, malaise), while approximately 20% may have more severe clinical manifestations (pneumonia and clinical complications); requiring hospital admission. People with severe manifestations of the disease usually have underlying diseases such as high blood pressure, cardiovascular disease, diabetes and chronic respiratory disease. Some time after the spread of the virus throughout the world, it was evidenced that the main route of transmission was by secretions of infected people, mainly by direct contact with respiratory droplets. SARS-CoV-2 was detected in nasopharyngeal secretions, including saliva. Currently, there is no specific treatment against SARS-CoV-2, subsequently, a stable inoculation method was created by pharmaceutical companies (AstraZeneca, Pfizer, Johnson & Johnson, Sputnik V, etc.); Then, in 2021, a mass vaccination was carried out to control the physiopathogenesis of the disease, in addition; The use of antibiotics served to prevent superadded bacterial pneumonias (4).

In Ecuador, the health situation has developed progressively with an alarming contagion. To date, there are a total of 801,180 positive cases by PCR tests, of which 35,040 deaths are registered, due to confirmed cases of COVID-19 and deaths due to suspicion. In the province of Tungurahua, a total of 14,459 positive cases and 619 deaths are currently reported (5).

One problem that has led to the treatment of COVID-19 is its ability to mutate virally; when the virus is in the adaptation phase in a new host. Therefore, WHO establishes the importance of integrating the detection of new variants in COVID-19 surveillance to characterize the evolution of an epidemic of larger scales and that further damages the global situation due to changes in transmission, pathogenicity and outbreak investigation. These outbreaks called variants have led in several cases to greater spread, contagion and in many cases greater mortality, leaving useless even the treatments already applied (6).

With all these considerations exposed, the work focuses on the current description of morbidity and mortality in COVID-19 positive patients at the "Ambato" Teaching General Hospital, to understand the behavior of the virus in the different age groups with comorbidities.

2. Materials And Methods

The scientific research consists of the analytical, systematic review with a very rigorous and exhaustive meta-analysis of all COVID-19 positive patients clinically assisted at the Ambato Teaching General Hospital; from January to May 2021. Therefore, it is a qualitative and quantitative study, which includes the official and reliable database, together with the complete statistical records, which were granted by the Ministry of Public Health of Ecuador; Therefore, an in-depth random sampling of official clinical-epidemiological data was also applied in the work; to add to the research a more transversal analysis, highlighting in this way an assessment of the growing morbidity and mortality in the province of Tungurahua; therefore, the work has purely statistical and prospective characteristics of the reality left by the SARS-CoV-2 virus; and increased mortality due to chronic comorbidities. We searched literature systematically and used only outstanding and reliable information; through systematic search tools such as Scopus, Pubmed, ClinicalKey, UpToDate, Scielo, Orphanet, Clinical Evidence, Biblioteca virtual em saúde (VHL) and DynaMed; using a 95% confidence security interval and official registration models of the Ministry of Public Health of Ecuador, where all accurate and truthful information was verified in a form designed for this purpose.

3. Results and Discussion

Through the complete analysis of the clinical-epidemiological databases of all patients received at the Ambato Regional Teaching Hospital, and an analysis of current knowledge in the pathogenesis was obtained as a result: that it is not only a pulmonary inflammatory process, and is not causing only a viral pneumonia, but rather it is a local and systemic inflammatory process involving different organs, coagulation disorders and alterations in immunity, making mature adults (40 – 64 years of age) and older adults (> 65 years of age) with chronic comorbidities more vulnerable, by causing an increase in the severity of COVID-19 disease and further increasing mortality. (3)

In the analysis of the results these show that; the highest prevalence of COVID-19 cases is found in mature adults (40-65 years) with 48.1% of registered cases, followed by older adults (>65 years) with

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38.8%, young adults (19-33 years) 12.3%; adolescents and schoolchildren with 0.3% each respectively. In addition, the affectionation of these cases occurred with a higher percentage in men with 61.2% when compared with women with 38.7%. Detailing the most frequent complication presented by these patients, it can be mentioned that pneumonia due to other viruses occurs in a higher percentage with 39.3%, followed by unspecified viral pneumonia 38.7%, primary essential hypertension 13.3%, left ventricular failure 10.1%. (See Table N. 1)


COVID-19 POSITIVE PATIENTS, YEAR: 2021										
Ambato Teaching General Hospital										
RESULTS										
AGE GROUP	%	AGE RANGE	%	TYPE OF INSURANCE	%	MOST FREQUENT COMORBIDITIES	ICD-10	%	PLACE OF RESIDENCE	%
Mature Adult	48.1	40 years — 65 years	48.1	No insurance	86.4	1.PNEUMONIA DUE TO OTHER VIRUSES	U071	39.3	TUNGURAHUA	94.3
						2. VIRAL PNEUMONIA NOT SPECIFIED	U072	38.7		
Older Adult	38.8	Over 65 years old	38.8	IESS, general insurance affiliate:	10.8	3.PRIMARY ESSENTIAL HYPERTENSION	J129	13.3		
						4.LEFT VENTRICULAR FAILURE	U072	10.1		
Young Adult	12.3	19 years — 39 years	12.3			5.TYPE 2 DIABETES MELLITUS, NO MENTION OF COMPLICATION	J128	5.9	COTOPAXI	3.5
						6.ACUTE RESPIRATORY FAILURE	J128	3.4		
Adolescent	0.3	13 years — 18 years	0.3	ISSPOL Insurance	0.8	7.ADULT RESPIRATORY DISTRESS SYNDROME	J128	2.7	CHIMBORAZO	1.1
Pupil	0.3	6 years — 12 years	0.3			8.CONGESTIVE HEART FAILURE	U072	2.03		
						9.CHRONIC KIDNEY DISEASE, UNSPECIFIED	I10X	1.3		
RESULTS										
SEX	%	ETHNIC GROUP	%	MONTH OF INCOME	%	DIAGNOSIS MAIN	ICD-10	%	NATIONALITY	%
MEN:	61.2	Mestizos	96.4	January	27.1	COVID-19, virus identified:	U071	57.8	ECUADORIAN: 827	98.8
				February	22.9					
WOMEN:	38.7	Indigenous	3.3	April	21.8	COVID-19, unidentified virus:	U072	42.1	VENEZUELAN: 6 COSTA RICA: 1 COLOMBIA: 1 CUBA: 1	0.7
		White	0.2	May	15.1					
RESULTS										
DISCHARGE CONDITION		%	DISABILITY		%	NUMBER OF DAYS OF HOSPITALIZATION				
Alive: 498		59.4%	No		0.0%	High index: 104 days				
Deaths in less than 48 hours: 90		10.7%				Low index: 1 day				
Deaths in more than 48 hours: 249		29.7%				Average: 6.93 days				
TOTAL, COVID-19 POSITIVE PATIENTS:			837 patients who were clinically attended, from January to May at the General Teaching Hospital "Ambato" in the period 2021.							

Table N°1: RESULTS.

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Source: Ambato Regional Teaching Hospital, Internal Medicine. (2021) tag.

The majority prevalence of cases reported and treated in this health home occurs in the month of January 2021 with 27.1% followed by February 22.9%, April 21.8%, May 15.1%, March 12.9%. With a denotation that most of the patients treated at the Ambato Teaching Hospital do not have affiliation to any insurance for their respective care. (See Table N. 1)

When talking about the mortality of patients treated in this period, the percentage is distributed from a total of 59.4% living discharges from this health home, 29.7% patients died in more than 48 hours, 10.7% patients died in less than 48 hours. In the hospitalization period, this is distributed in its highest rate of 104 days hospitalized and its overall average around 94.6 days. (See Table N. 1)

The severe acute respiratory syndrome or SARS-CoV-2 that causes the COVID-19 disease has generated a devastating pandemic, where the risk of ending human lives has increased, on the other hand, the vast majority of people who overcame the disease ended up with sequelae in their physical and mental integrity. Therefore, the viral infectious disease, physiopathologically has behaved in such an annihilating way in patients with comorbidities of chronic course, so that the high mortality rate increases exponentially when there is a link with the age of the patient; mature adults (40 – 64 years of age) and older adults (> 65 years), so that the pathogenesis of the disease has a tendency to be more aggressive if it is further linked to any with chronic comorbidity (5). Therefore, younger patients (< 40 years of age) suffering from associated pathologies should not be underestimated, since they are also at risk of complications. Therefore, it is important to note that an aggravation of SARS-CoV-2 infection involves serious pulmonary involvement, followed by evolutionary complications such as inflammatory processes at the systemic level, with multiorgan involvement and severe coagulation disorders that justify the high mortality (3).

The age groups that have proven to be more vulnerable and susceptible are: mature adults and older adults, so that the alarm symptoms manifested are sudden dyspnea, atypical hypoxemia without fever, a notable decrease in consciousness, and adinamia and inappetence. (See Table N. 1) (4) Therefore, patients with comorbidities such as type 2 diabetes mellitus; it has been shown that the virus destroys the pancreatic islets, in such a way that it further decreases the deficient insulin production they may have; therefore; vascular involvement can be intense affecting both microvascular and macrovascular level, This is if we add immunosenescence, which is the gradual deterioration of the immune system due to aging; these diabetic patients would be more inclined to a microvascular involvement to diabetic nephropathy that would lead to a fatal complication such as chronic kidney disease (CKD). (2)

On the other hand, arterial hypertension, ischemic heart disease with its forms of expression and cerebrovascular disease ratify a macrovascular involvement, especially in geriatric patients, which leads them to be a vulnerable group with a higher mortality rate. (1) Instead; chronic kidney disease (CKD), anemia that causes hypoxemia, immunosuppression such as HIV in its AIDS phase or malnutrition itself, hydroelectrolyte, acid-base and coagulation disorders, make the patient more vulnerable; since, the same disease by COVID-19 is characterized by generating a series of thromboembolic pathologies, which would increase the risk of really potential complications of the viral disease by COVID-19, which would drastically increase mortality. (2) (See Table N. 1)

4. Conclusion

In conclusion, the pathogenesis in COVID-19 patients; in the records provided by the Ambato Teaching General Hospital, it is evident that the existence of some comorbidity of chronic course, especially in cardiovascular, respiratory, renal and endocrine-metabolic pathologies; adding to this, in the most vulnerable populations such as mature adults (40 – 64 years of age); older adults (> 65 years); (See Table N. 1) would explain the high mortality rate and the implications of the appearance of critical cases, due to the severity of the evolutionary complications leading to a fatal human life, so that the effectiveness of an adequate therapeutic approach decreases to affected patients.

References:

1. Urizarri P, Rodríguez R, Almaguer M. Comorbidities and clinical severity of COVID-19: systematic review and meta-analysis. Rev haban cienc méd [Internet]. 2020 [cited 11/03/21]; 19: E3389. **Available in:** <http://www.revhabanera.sld.cu/index.php/rhab/article/view/3389>
2. Serra M.A. COVID-19. From pathogenesis to high mortality in the elderly and with comorbidities. Rev haban cienc méd [Internet]. 2020 June [Cited 24/04/21]; 19(3): 3379. **Available in:** http://scielo.sld.cu/scielo.php?script=sci_arttext&pid=S1729-519X2020000300004&lng=es.
3. Asselta R, Paraboschi EM, Mantovani A, Duga S. ACE2 and TMPRSS2 variants and expression as candidates to sex and country differences in COVID-19 severity in Italy. MedRxiv [Internet]. New York: Cold Spring Harbor; 2020 [Cited 06/05/2021]. **Available in:** <https://doi.org/10.1101/2020.03.30.20047878>
4. Bernal M, Avilés F, Álvarez J, Aldecoa C, López C, Díaz P. Consensus document of the Spanish Society of Intensive Medicine, Critical Care, and Coronary Units (SEMICYUC), the Spanish Society of Otolaryngology and Head and Neck Surgery (SEORL-CCC) and the Spanish Society of Anesthesiology and Resuscitation (SEDAR) on tracheostomy in patients with COVID-19. Elsevier- ClinicalKey [Internet]. 2020. [16/05/2021]; 1008 (7): 1-7. **Available in:** <https://www.clinicalkey.es/#!/content/journal/1-s2.0-S0001651920300789>
5. Ministry of Public Health of the Republic of Ecuador. Coronavirus COVID 19. [Internet]. 2006 May [cited 23/04/2021]; **Available in:** <https://www.salud.gob.ec/actualizacion-de-casos-de-coronavirus-en-ecuador/>
6. Ministry of Public Health of Spain. Coronavirus disease, COVID-19. [Internet]. 2006 May [cited 25/05/2021]; **Available in:** https://www.mscbs.gob.es/profesionales/saludPublica/ccayes/alertasActual/nCov/documentos/ITC_oronavirus.pdf
7. Andersen KG, Rambaut A, Lipkin W, Holmes EC, Garry RF. The proximal origin of SARS-CoV-2. Nature Medicine. 2020; 26:450-5.
8. World Health Organization. Coronavirus disease (COVID-19). Situation Report-105. [Internet]. Geneva: World Health Organization; 2020 [Cited 01/03/21]. **Available in:** http://www.who.int/docs/defaultsource/coronaviruse/situationreports/20200504-covid-19-sitrep105.pdf?sfvrsn=4cdda8af_2
9. Brown L. ClinicalKey. J Med Libr Assoc. 2013;101(4):342–3.
10. Rothan H, Byrareddy S. The epidemiology and pathogenesis of coronavirus disease (COVID19) outbreak. J Autoimmun [Internet]. 2020 [cited 01/06/2021];109. **Available in:** <https://pubmed.ncbi.nlm.nih.gov/32113704/>