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Abstract

There have been 35,737 fatalities and 4,544,626 confirmed cases of Covid-19 in Malaysia as of June 2022. Based on previous study, Covid-19 patients who have comorbidity are likely to have increased risk of fatality. In this regard, the present study is designed to collect preliminary data that prove the potential relationship between comorbidity and Covid-19 fatality in Malaysia. The data was extracted from Covid-19 official website (COVIDNOW) using Microsoft Excel. These comprises of number of deaths, number of cases, age, gender, and country of origin and any coexisting conditions. Results show that among 471 deceased of Covid-19 patients, 22.5% of them had no comorbidity while 77.5% of the mortality had comorbidities. This is led by hypertension as the top one (52.23%), followed by diabetes (36.73 %) and heart disease (15.71 %). This study highlights the potential link between comorbidity status and deceased Covid-19 patients in Malaysia. However, further in-dept research is still necessary to thoroughly understand the link between these two variables. These data signal the importance of proper Covid-19 management among patients with comorbidity.

Keywords: COVID-19, Comorbidity, Diabetes, Heart Disease, Hypertension

Introduction

Coronavirus disease, primarily known as Covid-19 is a communicable disease caused by contagious coronavirus strain which is acute respiratory syndrome coronavirus 2 (SARSCoV-2) (Tan et al., 2022). The first outbreak of this virus was reported in Wuhan, China in December 2019. To date, there have been 30,000 deaths people died of Covid-19 in the country (Lim et al., 2022). The first case of Covid-19 in Malaysia was discovered on January 25th, involving three Chinese nationals who arrived in Malaysia via Singapore on January 24, 2020. They had previously been in close contact with an affected individual in Singapore (Elengoe, 2020). The risk factors for Covid-19 include age, ethnicity, gender, underlying medical conditions or comorbidities, use of certain medications and many more (Gao et al., 2021). Comorbidity refers to the presence of more than one disease or condition in the same person simultaneously and they are frequently chronic conditions (Valderas et al., 2009) . In this study

context, the patients are suffering from pre-existing conditions and Covid-19 infection, simultaneously. About 90% of the hospitalized patients had one or more underlying diseases which are hypertension (15.80%), cardiovascular and cerebrovascular conditions (11.7%), diabetes (9.40%), co-existing infections like HIV and Hepatitis B (1.50%), and malignancy (1.50%), respiratory disorder (1.40%), renal disorder (0.8%), and immunodeficiency states (0.01%) (Sanyaolu et al., 2020). Most of these types of diseases are classified as noncommunicable diseases (NCD). NCD is a non-human transmissible and chronic disease caused by an unhealthy lifestyle (Olatona et al., 2018). In Malaysia, NCD is the most prevalent comorbidity in Malaysia (Mustapha et al., 2014). Previous research has found that comorbidity has an impact on Covid-19 infection. It not only increases the risk of infection, but it also exposes patients with serious adverse outcomes and worsen prognosis (Sanyaolu et al., 2020). In accordance to that, this study is conducted to analyse the distribution of comorbidity among Covid-19 deceased patients in Malaysia. The findings would signify the importance of proper management on Covid-19 patients with comorbidities.

Methodology

This is a retrospective study and it was carried out to determine the prevalence of comorbidity in COVID-19 deceased patients in Malaysia. Existing data published in daily press conferences were collected from the Ministry of Health via the Official Covid-19 website (COVIDNOW). The data was taken from October 2021 until March 2022.

Results

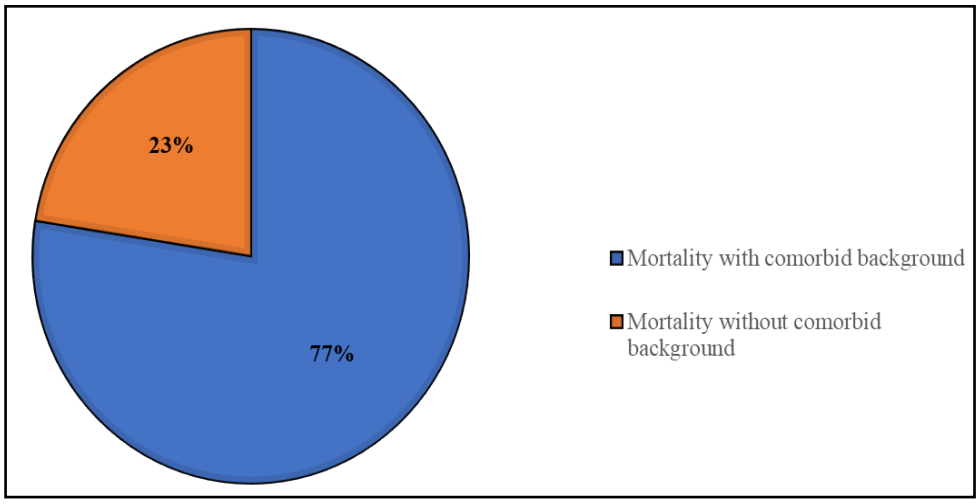

Figure 1. The percentage of comorbidities among 471 deceased Covid-19 patients in Malaysia

Table 1
Type of comorbidities among 471 deceased Covid-19 patients in Malaysia

Type of comorbidity	**Percentage (%)**
Hypertension	52.23
Diabetes	36.73
Heart disease	16.77
Kidney disease	14.23
Dyslipidemia	11.25
Stroke	9.98
Respiratory disorder	4.88
Cancer	3.82
Gout	3.82
Obesity	3.82
Arthritis	1.49
Lung disease	1.49
Chronic disease	1.49
Disability	1.27
Thyroid disorder	1.27
Tuberculosis	1.27
Autoimmune disease	1.06
Brain disorder	1.06
Cataract	0.85
Prostate gland disorder	0.64
Bone fracture	0.42
Impaired immunity	0.42
Psoriasis	0.42
Hepatitis	0.42
Hydrocephalus	0.42
Spinal bone disorder	0.42
Adrenal insufficiency	0.21
Blood borne disease	0.21
Dyspepsia	0.21
Gastritis	0.21
Sinusitis	0.21
Obstructive sleep apnea	0.21

Discussion

Based on the figure 1, among 471 deceased Covid-19 patients of various ages, genders, and comorbidities, only 106 of the patients did not have any comorbid condition. This represents 22.5% of mortality while 77.5% of mortality or 365 patients had comorbid condition. These include hypertension (52.23 %), diabetes (36.73 %), heart disease (15.71 %), kidney disease (13.59 %), dyslipidemia (11.25 %), stroke (9.98 %), respiratory disorder (4.88 %), cancer, gout and obesity (3.82 %) and many more as listed in Table 1. The findings indicate high prevalence of comorbidity among Covid-19 deceased patients and hypertension is on top of the list. The prognosis of patients with Covid-19 may be impacted by the underlying

disorders for a variety of reasons. This is because the underlying illness affects the patient's immunity, nutritional status, physically and mental well-being (Choi et al., 2021). The prognosis has been shown to be worsen in the elderly (Sanyaolu et al., 2020). As shown by previous study, long term diabetes and hypertension can damage the vascular structure and weaken heart function (Zhang et al., 2022). This could become more serious especially when Covid-19 strikes and the virus itself has been proved to cause myocarditis (Siripanthong et al., 2020). It is believed that hyperglycaemia in diabetes disease may enhance viral replication, as many studies have revealed that infected cells tend to manipulate glycolytic metabolism to secure virus precursors for production and assembly (Subbaram et al., 2022). In addition, the degree of immune impairment correlates with disease severity (Wang et al., 2021). Diabetes can form hyperglycaemic pulmonary microangiopathy that has been linked to systemic inflammation and platelet dysfunction. As a matter of fact, hyperglycaemia can directly accelerate disease progression as it contributes to inflammatory overactivation and coagulopathy which are the major features in COVID-19 severity. (Fadini et al., 2020). In the pre-existence of heart disease, direct viral infection of SARS-CoV-2 can lead to a severe condition among COVID-19 patients. An in vitro study by Sharma and co-researchers in 2020 revealed that SARS-CoV-2 infects and replicates efficiently in human pluripotent stem cell-derived cardiomyocytes by binding to ACE2. Consequently, this result in the termination of heart beating, cell apoptosis, impaired electrophysiological and contractile function is impaired which may contribute to in vivo cardiac complications (Sharma et al., 2020). Furthermore, the inflammation caused by COVID-19 can worsen pre-existing disease. In the case of atherosclerosis, for example, the inflammatory response will attract cytokine-secreting cells to the heart muscle, causing the coronary atherosclerotic plaques to rupture. The burst plaque causes blood vessel rupture and thrombus formation that could lead to other cardiac complications such as myocardial infraction (Sato et al., 2021). A direct viral invasion also causes myeloid cell activation. This subsequently trigger cytokine storm resulting in tubular epithelial and podocyte damage. This eventually lead to rhabdomyolysis where the damage muscle tissue releases proteins and electrolytes that can damage not only kidney but also cardiac (Batlle et al., 2020). Besides that, underlying kidney injury led to worse prognosis of COVID-19 by increasing the risk of pulmonary edema, thromboembolism, and bleeding disorders (Dadson et al., 2020). It has also been proposed that patients with COPD and smokers have a more severe infection because tobacco use influences the regulation of ACE-2 expression, resulting in these patients having an overexpression of ACE-II, the virus's receptor for entry into the cell (Gomez Antunez et al., 2020). Covid-19 patients with comorbid condition not only affect the prognosis, it also reduces the time taken for recovery. According to the study, viral clearance will take 3 days longer for one comorbidity and 4 days longer for two or more (Hoffman et al., 2021). This mainly affect the elderly compared to younger individual. As suggested by some studies that children are significsantly less likely than adults to develop severe or fatal COVID-19 (Zimmermann & Curtis, 2021). Some proposed factors include a stronger innate immune response that aids in viral clearance, a weaker adaptive immune response that leads to less hyperinflammation, and pre-existing immunity from exposure to commonly circulating coronaviruses via the common cold (Zimmermann & Curtis, 2021).

Conclusion

In a nutshell, there is a linkage between Covid-19 and comorbidity. Comorbidity has been discovered as one of the risk factors for severe COVID-19 illness (Sanyaolu et al., 2020).

A person with comorbidity is more likely to contract covid-19 infection due to immune system impairment and it is also found to cause severe manifestation and mortality. Next, the results also revealed that hypertension is ranked as the highest among other comorbid conditions (52.23%). This is followed by diabetes (36.73 %), heart disease (15.71 %), kidney disease (13.59 %), and many more. This indirectly signify the importance of proper management for patients with comorbidities. Additionally, this could also trigger an awareness about the Covid-19 prevention.

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References

Batlle, D., Soler, M. J., Sparks, M. A., Hiremath, S., South, A. M., Welling, P. A., & Swaminathan, S. (2020). Acute Kidney Injury in COVID-19: Emerging Evidence of a Distinct Pathophysiology. *Journal of the American Society of Nephrology : JASN*, *31*(7), 1380–1383. https://doi.org/10.1681/ASN.2020040419

Choi, Y. J., Park, J.-Y., Lee, H. S., Suh, J., Song, J. Y., Byun, M.-K., Cho, J. H., Kim, H. J., & Park, H. J. (2021). Variable effects of underlying diseases on the prognosis of patients with COVID-19. *PloS One*, *16*(7), e0254258. https://doi.org/10.1371/journal.pone.0254258

Dadson, P., Tetteh, C. D., Rebelos, E., Badeau, R. M., & Moczulski, D. (2020). Underlying Kidney Diseases and Complications for COVID-19: A Review. *Frontiers in Medicine*, *7*, 600144. https://doi.org/10.3389/fmed.2020.600144

Elengoe, A. (2020). COVID-19 Outbreak in Malaysia. *Osong Public Health and Research Perspectives*, *11*(3), 93–100. https://doi.org/10.24171/j.phrp.2020.11.3.08

Fadini, G. P., Morieri, M. L., Boscari, F., Fioretto, P., Maran, A., Busetto, L., Bonora, B. M., Selmin, E., Arcidiacono, G., Pinelli, S., Farnia, F., Falaguasta, D., Russo, L., Voltan, G., Mazzocut, S., Costantini, G., Ghirardini, F., Tresso, S., Cattelan, A. M., … Vettor, R. (2020). Newly-diagnosed diabetes and admission hyperglycemia predict COVID-19 severity by aggravating respiratory deterioration. *Diabetes Research and Clinical Practice*, *168*, 108374. https://doi.org/10.1016/j.diabres.2020.108374

Gao, Y., Ding, M., Dong, X., Zhang, J., Azkur, K. A., Azkur, D., Gan, H., Sun, Y., Fu, W., Li, W., Liang, H., Cao, Y., Yan, Q., Cao, C., Gao, H., Brüggen, M.-C., van de Veen, W., Sokolowska, M., Akdis, M., & Akdis, C. A. (2021). Risk factors for severe and critically ill COVID-19 patients: A review. *Allergy*, *76*(2), 428–455. https://doi.org/https://doi.org/10.1111/all.14657

Hoffman, E. N., Kawachi, H., Hirayama, A., Zhang, J., Murayama, A., Masui, J., Fujita, S., Mori, Y., Hirayama, T., Ohara, T., Asada, R., & Iso, H. (2021). Factors associated with prolonged duration of viral clearance in non-severe SARS-CoV-2 patients in Osaka, Japan. *Environmental Health and Preventive Medicine*, *26*(1), 115. https://doi.org/10.1186/s12199-021-01035-y

Lim, P. Y., Md Said, S., Kadir Shahar, H., Azman, A. Z. F., Mokhtar, S. A., & Mahmud, A. (2022). COVID-19 Inpatient Deaths and Brought-in-Dead Cases in Malaysia. *Frontiers in Public Health*, *10*, 872838. https://doi.org/10.3389/fpubh.2022.872838

Mustapha, F., Omar, Z., Mihat, O., Noh, M. K., Hassan, N., Abu Bakar, R., Abd Manan, A., Ismail, F., Jabbar, N., Muhamad, Y., Rahman, L. A., Majid, F. A., Shahrir, S., Ahmad, E., Davey, T., & Allotey, P. (2014). Addressing non-communicable diseases in Malaysia: an integrative process of systems and community. *BMC Public Health*, *14 Suppl 2*(Suppl 2), S4. https://doi.org/10.1186/1471-2458-14-S2-S4

Olatona, F. A., Onabanjo, O. O., Ugbaja, R. N., Nnoaham, K. E., & Adelekan, D. A. (2018). Dietary habits and metabolic risk factors for non-communicable diseases in a university undergraduate population. *Journal of Health, Population, and Nutrition*, *37*(1), 21. https://doi.org/10.1186/s41043-018-0152-2

Sanyaolu, A., Okorie, C., Marinkovic, A., Patidar, R., Younis, K., Desai, P., Hosein, Z., Padda, I., Mangat, J., & Altaf, M. (2020). Comorbidity and its Impact on Patients with COVID-19. *SN Comprehensive Clinical Medicine*, *2*(8), 1069–1076. https://doi.org/10.1007/s42399-020-00363-4

Sato, K., Sinclair, J. E., Sadeghirad, H., Fraser, J. F., Short, K. R., & Kulasinghe, A. (2021). Cardiovascular disease in SARS-CoV-2 infection. *Clinical & Translational Immunology*, *10*(9), e1343. https://doi.org/10.1002/cti2.1343

Sharma, A., Garcia, G. J., Wang, Y., Plummer, J. T., Morizono, K., Arumugaswami, V., & Svendsen, C. N. (2020). Human iPSC-Derived Cardiomyocytes Are Susceptible to SARS-CoV-2 Infection. *Cell Reports. Medicine*, *1*(4), 100052. https://doi.org/10.1016/j.xcrm.2020.100052

Siripanthong, B., Nazarian, S., Muser, D., Deo, R., Santangeli, P., Khanji, M. Y., Cooper, L. T. J., & Chahal, C. A. A. (2020). Recognizing COVID-19-related myocarditis: The possible pathophysiology and proposed guideline for diagnosis and management. *Heart Rhythm*, *17*(9), 1463–1471. https://doi.org/10.1016/j.hrthm.2020.05.001

Subbaram, K., Ali, P. S. S., & Ali, S. (2022). Enhanced endocytosis elevated virulence and severity of SARS-CoV-2 due to hyperglycemia in type 2 diabetic patients. *Gene Reports*, *26*, 101495. https://doi.org/10.1016/j.genrep.2022.101495

Tan, L., Ganapathy, S. S., Chan, Y. M., Alias, N., Nasaruddin, N. H., Khaw, W.-F., & Omar, A. (2022). Estimating the COVID-19 mortality burden over two full years of the pandemic in Malaysia. *The Lancet Regional Health – Western Pacific*, *22*. https://doi.org/10.1016/j.lanwpc.2022.100456

Valderas, J. M., Starfield, B., Sibbald, B., Salisbury, C., & Roland, M. (2009). Defining comorbidity: implications for understanding health and health services. *Annals of Family Medicine*, *7*(4), 357–363. https://doi.org/10.1370/afm.983

Wang, X., Zhang, H., Du, H., Ma, R., Nan, Y., & Zhang, T. (2021). Risk Factors for COVID-19 in Patients with Hypertension. *The Canadian Journal of Infectious Diseases & Medical Microbiology = Journal Canadien Des Maladies Infectieuses et de La Microbiologie Medicale*, *2021*, 5515941. https://doi.org/10.1155/2021/5515941

Zimmermann, P., & Curtis, N. (2021). Why is COVID-19 less severe in children? A review of the proposed mechanisms underlying the age-related difference in severity of SARS-CoV-2 infections. *Archives of Disease in Childhood*, *106*(5), 429–439. https://doi.org/10.1136/archdischild-2020-320338