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Boletim BiblioCovid

Boletim BiblioCovid v.2 n.6, junho 2021 | Covid 19, Comorbidade e Fatores de Risco

Boletim destinado a apresentação de estratégias e artigos científicos sobre temas relacionados à Covid-19.
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Covid 19, Comorbidade e Fatores de Risco

Vocabulário controlado

MeSH – Medical Subject Headings (NLM/NIH)
DeCS

Bases utilizadas

MEDLINE (PubMed)

Termos Utilizados (com base no Medical Subject Headings - MeSH):

Descritores e/ou palavras-chave

SARS-COV-2
COVID-19/complications
Comorbidity
Risk Factors

Filtros utilizados

Filters applied: Clinical Trial, Meta-Analysis, Review, Systematic Review, Humans, English, Portuguese, Spanish, from 2020 – 2021. Fator de impacto, artigos revisados por pares e data de publicação do artigo

Estratégias de busca

("COVID-19/complications") OR (("COVID-19"[Mesh] OR "SARS-CoV-2"[Mesh]) AND ("Comorbidity"[Mesh] OR "Risk Factors"[MeSH Terms]))

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Seleção dos dez artigos mais relevantes, segundo critérios da base de dados Portal regional BVS, incluindo os filtros, "Artigo" "Free full text", "Ano: 2020-2021

1. COVID-19 and Cancer Comorbidity: Therapeutic Opportunities and Challenges

doi: 10.7150/thno.51471

Resumo

The coronavirus disease 2019 (COVID-19) is a viral disease caused by a novel severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) that affects the respiratory system of infected individuals. COVID-19 spreads between humans through respiratory droplets produced when an infected person coughs or sneezes. The COVID-19 outbreak originated in Wuhan, China at the end of 2019. As of 29 Sept 2020, over 235 countries, areas or territories across the globe reported a total of 33,441,919 confirmed cases, and 1,003,497 confirmed deaths due to COVID-19. Individuals of all ages are at risk for infection, but in most cases disease severity is associated with age and pre-existing diseases that compromise immunity, like cancer. Numerous reports suggest that people with cancer can be at higher risk of severe illness and related deaths from COVID-19. Therefore, managing cancer care under this pandemic is challenging and requires a collaborative multidisciplinary approach for optimal care of cancer patients in hospital settings. In this comprehensive review, we discuss the impact of the COVID-19 pandemic on cancer patients, their care, and treatment. Further, this review covers the SARS-CoV-2 pandemic, genome characterization, COVID-19 pathophysiology, and associated signaling pathways in cancer, and the choice of anticancer agents as repurposed drugs for treating COVID-19

Referência

PATHANIA, Anup S et al. COVID-19 and Cancer Comorbidity: Therapeutic Opportunities and Challenges. **Theranostics**, v. 11, n. 2, p. 731-753, 2021. doi: 10.7150/thno.51471. eCollection 2021.

2. COVID-19 patient transcriptomic and genomic profiling reveals comorbidity interactions with psychiatric disorders

doi: 10.1038/s41398-020-01151-3

Resumo

Psychiatric symptoms are seen in some COVID-19 patients, as direct or indirect sequelae, but it is unclear whether SARS-CoV-2 infection interacts with underlying neuronal or psychiatric susceptibilities. Such interactions might arise from COVID-19 immune responses, from infection of neurons themselves or may reflect social-psychological causes. To clarify this we sought the key gene expression pathways altered in COVID-19 also affected in bipolar disorder, post-traumatic stress disorder (PTSD) and schizophrenia, since this may identify pathways of interaction that could be treatment targets. We performed large scale comparisons of whole transcriptome data and immune factor transcript data in peripheral blood mononuclear cells (PBMC) from COVID-19 patients and patients with psychiatric disorders. We also analysed genome-wide association study (GWAS) data for symptomatic COVID-19 patients, comparing GWAS and whole-genome sequence data from patients with bipolar disorder, PTSD and schizophrenia patients. These studies revealed altered signalling and ontology pathways shared by COVID-19 patients and the three psychiatric disorders. Finally, co-expression and network analyses identified gene clusters common to the conditions. COVID-19 patients had peripheral blood immune system profiles that overlapped with those of patients with psychiatric conditions. From the pathways identified, PTSD profiles were the most highly correlated with COVID-19, perhaps consistent with stress-immune system interactions seen in PTSD. We also revealed common inflammatory pathways that may exacerbate psychiatric disorders, which may support the usage of anti-inflammatory medications in these patients. It also highlights the potential clinical application of multi-level dataset studies in difficult-to-treat psychiatric disorders in this COVID-19 pandemic.

Referência

MONI, Mohammad Ali et al. COVID-19 patient transcriptomic and genomic profiling reveals comorbidity interactions with psychiatric disorders. **Transl Psychiatry**, v. 11, n. 160, 2021. Doi. 10.1038/s41398-020-01151-3

3. Distinct effects of asthma and COPD comorbidity on disease expression and outcome in patients with COVID-19

doi:10.1111/all.14517

Resumo

Objective: To explore the influence of asthma and chronic obstructive pulmonary disease (COPD) comorbidity on disease expression and outcomes, and the potential underlying mechanisms in COVID-19 patients.

Methods: A total of 961 hospitalized COVID-19 patients with a definite clinical outcome (death or discharge) were retrospectively enrolled. Demographic and clinical information were extracted from the medical records. Lung tissue sections from patients suffering from lung cancer were used for immunohistochemistry study of angiotensin-converting enzyme II (ACE2) expression. BEAS-2B cell line was stimulated with various cytokines.

Results: In this cohort, 21 subjects (2.2%) had COPD and 22 (2.3%) had asthma. After adjusting for confounding factors, COPD patients had higher risk of developing severe illness (OR: 23.433; 95% CI 1.525-360.135; P < .01) and acute respiratory distress syndrome (OR: 19.762; 95% CI 1.461-267.369; P = .025) than asthmatics. COPD patients, particularly those with severe COVID-19, had lower counts of CD4+ T and CD8+ T cells and B cells and higher levels of TNF-α, IL-2 receptor, IL-10, IL-8, and IL-6 than asthmatics. COPD patients had increased, whereas asthmatics had decreased ACE2 protein expression in lower airways, compared with that in control subjects without asthma and COPD. IL-4 and IL-13 downregulated, but TNF-α, IL-12, and IL-17A upregulated ACE2 expression in BEAS-2B cells.

Conclusion: Patients with asthma and COPD likely have different risk of severe COVID-19, which may be associated with different ACE2 expression.

Referência

SONG, Jia et al. Distinct effects of asthma and COPD comorbidity on disease expression and outcome in patients with COVID-19. Allergy, v. 76, n. 2, p. 483-496, 2021. doi: 10.1111/all.14517. Epub 2020 Aug 11

4. Prevalence of comorbidity in Chinese patients with COVID-19: systematic review and meta-analysis of risk factors

doi:10.1186/s12879-021-05915-0

Resumo

Background: Coronavirus disease 2019 (COVID-19) is an infectious disease characterized by cough, fever, and fatigue and 20% of cases will develop into severe conditions resulting from acute lung injury with the manifestation of the acute respiratory distress syndrome (ARDS) that accounts for more than 50% of mortality. Currently, it has been reported that some comorbidities are linked with an increased rate of severity and mortality among COVID-19 patients. To assess the role of comorbidity in COVID-19 progression, we performed a systematic review with a meta-analysis on the relationship of COVID-19 severity with 8 different underlying diseases.

Methods: PubMed, Web of Science, and CNKI were searched for articles investigating the prevalence of comorbidities in severe and non-severe COVID-19 patients. A total of 41 studies comprising 12,526 patients were included.

Results: Prevalence of some commodities was lower than that in general population such as hypertension (19% vs 23.2%), diabetes (9% vs 10.9%), chronic kidney disease (CKD) (2% vs 9.5%), chronic liver diseases (CLD) (3% vs 24.8%) and chronic obstructive pulmonary disease (COPD) (3% vs 8.6%), while some others including cancer (1% vs 0.6%), cardiovascular disease (6% vs 1.8%) and cerebrovascular disease (2% vs 0.9%) exhibited greater percentage in COVID-19. Cerebrovascular disease (OR = 3.70, 95%CI 2.51–5.45) was found to be the strongest risk factor in disease exacerbation, followed by CKD (OR = 3.60, 95%CI 2.18–5.94), COPD (OR = 3.14, 95% CI 2.35–4.19), cardiovascular disease (OR = 2.76, 95% CI 2.18–3.49), malignancy (OR = 2.63, 95% CI 1.75–3.95), diabetes (OR = 2.49, 95% CI 2.10–2.96) and hypertension (OR = 2.13, 95% CI 1.81–2.51). We found no correlation between CLD and increased disease severity (OR = 1.32, 95% CI 0.96–1.82).

Conclusion: The impact of all eight underlying diseases on COVID-19 deterioration seemed to be higher in patients outside Hubei. Based on different comorbidities, COVID-19 patients tend to be at risk of developing poor outcomes to a varying degree. Thus, tailored infection prevention and monitoring and treatment strategies targeting these high-risk subgroups might improve prognosis during the COVID-19 pandemic.

Referência

YIN, Tingxuan et al. Prevalence of comorbidity in Chinese patients with COVID-19: systematic review and meta-analysis of risk factors. **BMC Infectious Diseases**, v. 21, 200, 2021. doi.org/10.1186/s12879-021-05915-0

5. Impact of comorbidity burden on mortality in patients with COVID-19 using the Korean health insurance database

doi:10.1038/s41598-021-85813-2.

Resumo

We aimed to investigate the impact of comorbidity burden on mortality in patients with coronavirus disease (COVID-19). We analyzed the COVID-19 data from the nationwide health insurance claims of South Korea. Data on demographic characteristics, comorbidities, and mortality records of patients with COVID-19 were extracted from the database. The odds ratios of mortality according to comorbidities in these patients with and without adjustment for age and sex were calculated. The predictive value of the original Charlson comorbidity index (CCI) and the age-adjusted CCI (ACCI) for mortality in these patients were investigated using the receiver operating characteristic (ROC) curve analysis. Among 7590 patients, 227 (3.0%) had died. After age and sex adjustment, hypertension, diabetes mellitus, congestive heart failure, dementia, chronic pulmonary disease, liver disease, renal disease, and cancer were significant risk factors for mortality. The ROC curve analysis showed that an ACCI threshold > 3.5 yielded the best cut-off point for predicting mortality (area under the ROC 0.92; 95% confidence interval 0.91-0.94). Our study revealed multiple risk factors for mortality in patients with COVID-19. The high predictive power of the ACCI for mortality in our results can support the importance of old age and comorbidities in the severity of COVID-19.

Referência

CHO, Soo Ick; YOON, Susie; LEE, Ho-Jin. Impact of comorbidity burden on mortality in patients with COVID-19 using the Korean health insurance database. **Sci Rep**, v. 11, n. 1, 6375, 2021. doi: 10.1038/s41598-021-85813-2.

6. Racial disparities in COVID-19 outcomes exist despite comparable Elixhauser comorbidity indices between Blacks, Hispanics, Native Americans, and Whites

doi:10.1038/s41598-021-88308-2.

Resumo

Factors contributing to racial inequities in outcomes from coronavirus disease 2019 (COVID-19) remain poorly understood. We compared by race the risk of 4 COVID-19 health outcomes--maximum length of hospital stay (LOS), invasive ventilation, hospitalization exceeding 24 h, and death--stratified by Elixhauser comorbidity index (ECI) ranking. Outcomes and ECI scores were constructed from retrospective data obtained from the Cerner COVID-19 De-Identified Data cohort. We hypothesized that racial disparities in COVID-19 outcomes would exist despite comparable ECI scores among non-Hispanic (NH) Blacks, Hispanics, American Indians/Alaska Natives (AI/ANs), and NH Whites. Compared with NH Whites, NH Blacks had longer hospital LOS, higher rates of ventilator dependence, and a higher mortality rate; AI/ANs, higher odds of hospitalization for ECI = 0 but lower for ECI ≥ 5, longer LOS for ECI = 0, a higher risk of death across all ECI categories except ECI ≥ 5, and higher odds of ventilator dependence; Hispanics, a lower risk of death across all ECI categories except ECI = 0, lower odds of hospitalization, shorter LOS for ECI ≥ 5, and higher odds of ventilator dependence for ECI = 0 but lower for ECI = 1-4. Our findings contest arguments that higher comorbidity levels explain elevated COVID-19 death rates among NH Blacks and AI/ANs compared with Hispanics and NH Whites.

Referência

QEADAN, Fares et al. Racial disparities in COVID-19 outcomes exist despite comparable Elixhauser comorbidity indices between Blacks, Hispanics, Native Americans, and Whites. **Sci Rep**, v. 11, n. 1, 8738, 2021. doi: 10.1038/s41598-021-88308-2.

7. Unraveling the molecular crosstalk between Atherosclerosis and COVID-19 comorbidity

doi:10.1016/j.compbiomed.2021.104459

Resumo

Background: Corona virus disease 2019 (COVID-19) caused by Severe Acute Respiratory Syndrome Coronavirus −2 (SARS-CoV-2) has created ruckus throughout the world. Growing epidemiological studies have depicted atherosclerosis as a comorbid factor of COVID-19. Though both these diseases are triggered via inflammatory rage that leads to injury of healthy tissues, the molecular linkage between them and their co-influence in causing fatality is not yet understood.
Methods: We have retrieved the data of differentially expressed genes (DEGs) for both atherosclerosis and COVID-19 from publicly available microarray and RNA-Seq datasets. We then reconstructed the protein-protein interaction networks (PPIN) for these diseases from protein-protein interaction data of corresponding DEGs. Using RegNetwork and TRRUST, we mapped the transcription factors (TFs) in atherosclerosis and their targets (TGs) in COVID-19 PPIN.
Results: From the atherosclerotic PPIN, we have identified 6 hubs (TLR2, TLR4, EGFR, SPI1, MYD88 and IRF8) as differentially expressed TFs that might control the expression of their 17 targets in COVID-19 PPIN. The important target proteins include IL1B, CCL5, ITGAM, IFIT3, CXCL1, CXCL2, CXCL3 and CXCL8. Consequent functional enrichment analysis of these TGs have depicted inflammatory responses to be overrepresented among the gene sets.
Conclusion: Finally, analyzing the DEGs in cardiomyocytes infected with SARS-CoV-2, we have concluded that MYD88 is a crucial linker of atherosclerosis and COVID-19, the co-existence of which lead to fatal outcomes. Anti-inflammatory therapy targeting MYD88 could be a potent strategy for combating this comorbidity.

Referência

DAS, Deepyaman; PODDER, Soumita. Unraveling the molecular crosstalk between Atherosclerosis and COVID-19 comorbidity. Computers in Biology and Medicine, v. 134, 104459, 2021. doi.org/10.1016/j.compbiomed.2021.104459

8. Age-adjusted Charlson comorbidity index score is the best predictor for severe clinical outcome in the hospitalized patients with COVID-19 infection

doi:10.1097/MD.0000000000025900

Resumo

Aged population with comorbidities demonstrated high mortality rate and severe clinical outcome in the patients with coronavirus disease 2019 (COVID-19). However, whether age-adjusted Charlson comorbidity index score (CCIS) predict fatal outcomes remains uncertain.This retrospective, nationwide cohort study was performed to evaluate patient mortality and clinical outcome according to CCIS among the hospitalized patients with COVID-19 infection. We included 5621 patients who had been discharged from isolation or had died from COVID-19 by April 30, 2020. The primary outcome was composites of death, admission to intensive care unit, use of mechanical ventilator or extracorporeal membrane oxygenation. The secondary outcome was mortality. Multivariate Cox proportional hazard model was used to evaluate CCIS as the independent risk factor for death.Among 5621 patients, the high CCIS (≥ 3) group showed higher proportion of elderly population and lower plasma hemoglobin and lower lymphocyte and platelet counts. The high CCIS group was an independent risk factor for composite outcome (HR 3.63, 95% CI 2.45-5.37, P < .001) and patient mortality (HR 22.96, 95% CI 7.20-73.24, P < .001). The nomogram showed that CCIS was the most important factor contributing to the prognosis followed by the presence of dyspnea (hazard ratio [HR] 2.88, 95% confidence interval [CI] 2.16-3.83), low body mass index < 18.5 kg/m2 (HR 2.36, CI 1.49-3.75), lymphopenia (<0.8 x109/L) (HR 2.15, CI 1.59-2.91), thrombocytopenia (<150.0 x109/L) (HR 1.29, CI 0.94-1.78), anemia (<12.0 g/dL) (HR 1.80, CI 1.33-2.43), and male sex (HR 1.76, CI 1.32-2.34). The nomogram demonstrated that the CCIS was the most potent predictive factor for patient mortality.The predictive nomogram using CCIS for the hospitalized patients with COVID-19 may help clinicians to triage the high-risk population and to concentrate limited resources to manage them.

Referência

KIM, Do Hyoung et al. Age-adjusted Charlson comorbidity index score is the best predictor for severe clinical outcome in the hospitalized patients with COVID-19 infection. **Medicine**, v. 100, n. 18, e25900, 2021. doi: 10.1097/MD.0000000000025900.

9. Older age, comorbidity, glucocorticoid use and disease activity are risk factors for COVID-19 hospitalisation in patients with inflammatory rheumatic and musculoskeletal diseases

doi:10.1136/rmdopen-2020-001464

Resumo

Introduction: Whether patients with inflammatory rheumatic and musculoskeletal diseases (RMD) are at higher risk to develop severe courses of COVID-19 has not been fully elucidated. Aim of this analysis was to describe patients with RMD according to their COVID-19 severity and to identify risk factors for hospitalisation.
Methods: Patients with RMD with PCR confirmed SARS-CoV-2 infection reported to the German COVID-19 registry from 30 March to 1 November 2020 were evaluated. Multivariable logistic regression was used to estimate ORs for hospitalisation due to COVID-19.
Results: Data from 468 patients with RMD with SARS-CoV-2 infection were reported. Most frequent diagnosis was rheumatoid arthritis, RA (48%). 29% of the patients were hospitalised, 5.5% needed ventilation. 19 patients died. Multivariable analysis showed that age >65 years (OR 2.24; 95% CI 1.12 to 4.47), but even more>75 years (OR 3.94; 95% CI 1.86 to 8.32), cardiovascular disease (CVD; OR 3.36; 95% CI 1.5 to 7.55), interstitial lung disease/chronic obstructive pulmonary disease (ILD/COPD) (OR 2.79; 95% CI 1.2 to 6.49), chronic kidney disease (OR 2.96; 95% CI 1.16 to 7.5), moderate/high RMD disease activity (OR 1.96; 95% CI 1.02 to 3.76) and treatment with glucocorticoids (GCs) in dosages >5 mg/day (OR 3.67; 95% CI 1.49 to 9.05) were associated with higher odds of hospitalisation. Spondyloarthritis patients showed a smaller risk of hospitalisation compared with RA (OR 0.46; 95% CI 0.23 to 0.91).
Conclusion: Age was a major risk factor for hospitalisation as well as comorbidities such as CVD, ILD/COPD, chronic kidney disease and current or prior treatment with GCs. Moderate to high RMD disease activity was also an independent risk factor for hospitalisation, underlining the importance of continuing adequate RMD treatment during the pandemic.

Referência

HASSELI, Rebecca et al. Older age, comorbidity, glucocorticoid use and disease activity are risk factors for COVID-19 hospitalisation in patients with inflammatory rheumatic and musculoskeletal diseases. **RMD Open**, v. 7, n. 1, e001464, 2021. doi: 10.1136/rmdopen-2020-001464.

10. IL-6 and IL-10 are associated with disease severity and higher comorbidity in adults with COVID-19

doi:10.1016/j.cyto.2021.155507

Resumo

Aim: COVID-19 pandemic has caused extensive burden on public life and health care worldwide. This study aimed to assess circulating levels of inflammatory cytokines in adult patients who were hospitalized with COVID-19 and stratified according to age (older or younger than 65 years) aiming to explore associations between these markers of inflammation and comorbidities.
Methods: This was a cross-sectional study of 142 COVID-19 patients consecutively admitted to the University Hospital of the Federal University of São Carlos, from July to October 2020. Sociodemographic data, chronic comorbidities, and baseline NEWS2 and SOFA for clinical deterioration were obtained at hospital admission. Serum levels of inflammatory cytokines were determined by flow cytometry.
Results: Older adults with COVID-19 had higher serum levels of IL-6 and IL-10 as compared to those under 65 years of age ($p < 0.001$ and $p = 0.003$, respectively). IL-10 was independently associated with age ($p = 0.04$) and severity of the disease ($p = 0.05$), whereas serum levels of IL-6 were not directly associated with age ($p = 0.5$). The comorbidity index seems to be the main responsible for this, being significantly associated with IL-6 levels among those aged 65 and over ($p = 0.007$), in addition to the severity of the disease.
Conclusions: Higher serum levels of IL-6 and IL-10 are associated with the severity of the disease and a higher comorbidity index among adults aged 65 and over with COVID-19. This should raise awareness of the importance of comorbidity index, rather than age, during risk stratification.

Referência

LUPORINI, Rafael Luís et al. IL-6 and IL-10 are associated with disease severity and higher comorbidity in adults with COVID-19. **Cytokine**, v. 143, 155507, 2021. doi.org/10.1016/j.cyto.2021.155507

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