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Secondary Diagnosis of COVID-19 in Children Aged 0-18: A Case Study of an Inpatient in Central Java

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Abstract

Children ages 0 - 18 are more susceptible to infected COVID-19. The prognosis of patients can be significantly by the presence of a secondary diagnosis. This study category patients according to their age, sex, length of stay (LOS), subsequent diagnoses, and treatments. Samples are from the medical records of 19 patients, ages 0-18, hospitalized at X Hospital. The data are descriptively analyzed in this study using secondary data taken from the medical records of patients from April 2020 to February 2021. According to the study, 79% of COVID-19 patients were under five, 58% were men, and their average length of stay was 9.53 days. The most common secondary diagnoses were Febrile convulsions (9%), hypo-osmolality and hyponatremia (9%). Microscopic of specimens from the ear, nose, throat, and larynx (35%), other chest x-ray (27%), and microscopic of blood (8%) were the treatment and procedures the most frequently. Children who are COVID-19 patients between the ages of 0 - 18 have a high number of secondary diagnoses and medical procedures during therapy, more intensive monitoring.

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Introduction

According to WHO, a new strain of the Coronavirus, later known as COVID-19 or Corona Virus Disease 2019, the world on January 30. COVID-19 quickly expanded to other Asian nations, including Indonesia. Since The Minister of Health announced the first positive case on March 2, 2020, COVID-19 has spread throughout Indonesia (Kahar, Dirawan, Samad, Qomariyah, & Purlinda, 2020). In less than a month, positive cases increased from two to thousands throughout 34 regions. Severe Acute Respiratory Syndrome Coronavirus 2 is the cause of COVID-19, an inflammatory lung condition. The symptoms might range from those of a cold to more severe problems (such as pneumonia or sepsis). Contact with the afflicted' respiratory droplets can spread this. Droplets are microscopic, disease-carrying particles that emerge from the patient's mouth when coughing, sneezing, or speaking (Alberti et al., 2022). Droplets have a maximum range of movement typically up to one meter (Bahl et al., 2022). When the patient coughs or sneezes, droplets may adhere to clothing or other surfaces. However, these particles will only linger or settle in the air for a short time because of their size. Therefore, to stop the transmission of Covid-19, infected persons must wear a mask.

Parents are urged to maintain increased vigilance against the risk of infection to themselves and their children because of Indonesia's severe Covid-19 pandemic. As result, there are more and more cases of Covid-19 infection in youngsters. According to data from the Indonesian Pediatricians Association called IDAI, 2.5% of children had child mortality rates in Asia Pacific due to Covid 19(Aini, Anggraini, & Alifatin, 2021). The fact that numerous healthcare institutions are not ideal for the children who are Covid-19

positive is another factor aggravating the situation. Fewer human resources (HR) are currently available, including fewer doctors, nurses, and particular medications. Given this circumstance, numerous actions can be taken to protect children from contracting Covid-19. First, IDAI urged all events involving children between 0 and 18 years old to be held online. Second, unless it's essential, keep youngsters inside the house. Third, avoid situations ventilation, crowds or density, and the possibility of close contact when engaging in activities outside the house. Children, their families, and parents must also adhere to health procedures in a disciplined manner, whether at home or away from it. The risk of the coronavirus that causes Covid-19 and infecting kids still exists when kids stay inside, but their parents and siblings ignore health precautions while they are away from the house. Thus, the child's fundamental right to life by caring for the over 90 million Indonesian children born yearly. A better future for children, grandchildren, and the next generation depends on you taking good care of you and mental health.

Age is not a factor in the covid-19 coronavirus infection. This illness can affect adults, the elderly, and even children. Children have severity risk as adults, particularly if they have a secondary conditions. The risk of death is significant for pediatric patients with secondary diseases because they typically arrive at the hospital in serious condition. Children with cancer, chronic kidney failure, congenital heart disease, obesity, and malnutrition are a few of the most prevalent secondary diagnoses among children. The SARS-CoV-2 virus affects the respiratory, neurological system and digestive systems(Di Fusco et al., 2022). Virus affects the body's organs function in children with secondary diagnoses might increase co-morbidities and potentially. Because of this, the secondary diagnosis persisted even though he was found to be harmful for Covid-19. Additionally, as this virus can affect any portion of the body, each person will likely experience an unusual symptoms. Different symptoms can be detected in youngsters if the general Covid-19 symptoms are coughing and shortness of breath.

Infected children typically exhibit a high temperature, followed by coughing or shortness of breath(Kornitzer et al., 2021). Parents frequently underestimated the severity of mild symptoms. If Covid-19 individuals with additional diagnoses and symptoms don't receive prompt medical attention, their conditions could swiftly deteriorate. This led to the study's goal, which was to identify the risk variables in young COVID-19 patients. The period, location, research factors, and research criteria set this study apart from earlier ones. In light of the background information provided, it has been reported that scientists are interested in studying pediatric COVID-19 patients at Hospital X to analyze secondary diagnostics of Covid-19 in Children Aged 0–18 Years.

Methods

This study used all data of pediatric patients with confirmed COVID-19 aged 0 to 18 years, who were admitted to X Hospital in Central Java from medical records in March 2020 and February 2021. The study was carried out between May and August of 2021 and data processing involved descriptive analysis. This study describes gender, secondary diagnoses, treatment and procedures, length of stay (LoS), and patient age as the research variables to be examined. they are categorized into three age groups: 0–5 years, 6–12 years, and 13–18 years. they cassified as male or female. There are two treatment rooms for kids with Covid-19: cendrawasih rooms and non- cendrawasih rooms. For children's Covid-19, the secondary diagnosis and treatments were ranked as the top 6.

Results

In the hospital X in Central Java, there 19 patients of Covid-19 aged 0-18 years. The acquired data examined gender, secondary diagnoses, treatment and procedures, length of stay (LoS), and patient age. Table 1 displays the outcomes of processing information on the age of patients in Covid-19 children and their length of stay.

Table 1. Number of COVID-19 cases by age, sex and room group at Hospital X in Central Java

Characteristic		f	%	AVG LOS
Age	0 – 5	15	79	9,4
	6 – 12	3	16	10,33
	13 – 18	1	5	9
Sex	Male	11	58	11,09
	Female	8	42	7,38
Room	Cendrawasih	17	89	9,76
	Non-Cendrawasih	2	11	7,5
	Total	19	100	9,53

Table 1. shows 79% of COVID-19 instances are children aged 0 to 5 years, 16% are children aged 6 to 12 years, and 5% are children aged 13 to 18. Patients with COVID-19 who are 0–5 years old must stay for 9.4 days, 6–12 years old must stay for 10.33 days, and patients who are 13–18 years old must stay for 9 days. Boy (58%) have more significant risk of exposure to COVID-19 than girl (42%), as shown in Table 1 of COVID-19 cases, shown in the gender category. The average length of stay for boys with COVID-19 was 11.09 days, 7.38 days for girls. The COVID-19 cases are displayed in the room group category of the table with an average stay of 9.76 days and 89% of patients were in Cendrawasih room, the remaining 11% are in non-Cendrawasih room with an average stay of 7.5 days. Table 2. displays the outcomes of processing information on the secondary diagnoses.

Table 2. The top 6 secondary diagnoses in pediatric COVID-19 patients at Hospital X in Central Jawa

ICD 10	Secondary Diagnosis	f	%
R56.0	Febrile convulsions	4	9%
E87.1	Hypo-osmolality and hyponatremia	4	9%
E43	Unspecified severe protein-energy malnutrition	3	7%
E87.6	Hypokalaemia	3	7%
Q21.0	Ventricular septal defect	2	5%
K59.0	Constipation	2	5%
	TOP 6 Secondary Diagnosis	18	42%
	All Secondary Diagnosis	43	100%

The top 6 secondary diagnoses in COVID-19 cases in children between the ages of 0 and 18 were listed in Table 2. Febrile convulsions disease ranks number one with a 9% prevalence, followed by hyperosmolality and hyponatremia disease at number two with a 9% prevalence. Unspecified severe protein-energy malnutrition comes ~~in~~ at number 3 with a 7% prevalence, followed by hypokalemia at number 4 with a 7% prevalence. The majority of ventricular septal abnormalities is 5% in number 5, while constipation illness is 5% in children ages 0 to 18 in number 6. Table 3. displays the outcomes of processing information on the treatment and procedure.

Table 3. The top 6 treatments and procedures in pediatric COVID-19 patients at Hospital X in Central Java

ICD 9 CM	Treatment	f	%
90,39	Microscopic examination of specimen from ear, nose, throat, and larynx	17	35%
87,49	Other chest x-rays	13	27%
90,59	Microscopic examination of blood	4	8%
99,04	Transfusion of packed cells	3	6%
93,94	Respiratory medication administered by nebulizer	2	4%
99,05	Transfusion of platelets	2	4%
	TOP 6 Treatment	41	85%
	All Treatment	48	100%

Table 5 reveals 6 (six) COVID-19 cases in the category of treatments given to COVID-19 patients. In item number 1, there is a microscopic of a specimen from the patient's ear, nose, throat, and larynx by 35%. A 27% additional chest x-ray was found in number 2. A microscopic inspection of blood by 8% was included in number 3. An analysis of 6% packed cell transfusion was found in number 4. There is a 4% respiratory medicine delivered via a nebulizer in number 5. Then a 4% transfusion of platelets is examined in number 6.

Discussion

According to research, the immune system experiences several physiological changes as we age. These changes were broadly classified as immunosenescence and inflammation, which are variables that contribute to the immune system's steady deterioration. Due to the severity of the Covid-19 infection in male patients (Vierucci et al., 2020)(Gyllenberg et al., 2023), the transmission mechanism in males is higher

than in females. The coronavirus was related to the angiotensin-converting enzyme 2 (ACE 2), which is in many human organs, including heart, kidneys, lungs, and other organs (Cheng, Wang, & Wang, 2020) (Zhang et al., 2020). In contrast, women often have fewer viral receptors of these ACE2 kinds. Children with COVID-19, on the other hand, typically exhibit milder symptoms or even show no signs at all. This was believed to happen in children because the thymus gland, which serves as the body's immune system (Yan et al., 2017), is still functioning at its best.

Children with COVID-19 may also exhibit signs of digestive such as vomiting and diarrhea(Liu, Zhang, & Long, 2020), albeit this is uncommon. Children with symptoms of a coronavirus infection may also experience severe septic shock and acute respiratory distress syndrome or acute respiratory failure. Children are still susceptible to COVID-19, can occasionally result in more severe health issues, such as multisystem inflammatory syndrome (MIS-C) or organ damage from inflammation brought on by a coronavirus. Children may experience febrile convulsions or episodes brought on by a rise in body temperature (fever)(Dewiyanti et al., 2021). On the first day of a fever, febrile seizures are most frequent. Children who experience their first seizure should be assessed because can continue for many minutes but are typically not dangerous. Emergency medical attention is required for seizures that last longer than 10 minutes (Singer, Evankovich, Fisher, Demmler-Harrison, & Risen, 2021). Medicines to treat fever and prolonged seizures may be used

The COVID-19 swab test, which is the same as tests for adults and involves a nose swab to look for respiratory illnesses like the flu, must be performed on kids. Medical professionals will obtain throat, nose, and respiratory samples. Real-time reverse transcription polymerase chain reaction (RT-PCR) is currently the sole effective and commonly used method for detecting the COVID-19 virus (Zubairu Sadiq, 2021), specifically designed to target the SARS-Cov-2 genome. Aside from the fact that it is widely utilized, RT-PCR accuracy could be better. One of the variables that affect accuracy is sampling time. According to one study, a false-negative value had a 100% chance on day one and a 67% chance on day four (Kucirka, Lauer, Laeyendecker, Boon, & Lessler, 2020).

Conclusion

Based on data from 19 pediatric patients who tested positive for COVID-19 between March 2020 and February 2021, researchers discovered that 79% of patients were under the age of five, with an average length of stay of 9.4 days, 16% were between the ages of six and twelve, with an average length of stay of 10.33 days, and 5% were between the ages of thirteen and eighteen with an average length of stay of nine days. The average length of stay for the 19 pediatric patients was 11.09 days for 58% of the male patients and 7.38 days for 42% of the female patients. With an average stay of 9.76 days, the Children of Cendrawasih category has the most rooms at 89%. The most frequent secondary diagnoses among the 19 patients were febrile convulsions, hyperosmolality, and hyponatremia (9% each). Microscopic of samples from the ear, nose, throat, and larynx is a standard test and procedure for 35% of pediatric COVID-19 patients. It was advised that families with family members who fall into the category of children with secondary diagnoses take the necessary precautions to avoid contracting COVID-19 because it will have a poor prognosis. This is because the number of patients confirmed positive for COVID-19 keeps rising each month.

Author Contributions

Conceptualization, Evina W; methodology, Florensia B B.; writing original draft preparation, Afia A.; writing review and editing, Florensia B B.; visualization, Niantiara A.S.M; supervision, Evina W. All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest:

The authors declare no conflict of interest.

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