

## DAFTAR ISI

	Halaman
Sampul .....	.....
Judul .....	i
Halaman Pengesahan .....	ii
Pernyataan Keaslian Penelitian .....	iii
Kata Pengantar.....	iv
Ucapan Terima Kasih .....	v
Prasyarat Gelar .....	ix
Lembar Persetujuan .....	x
Abstract .....	xi
Abstrak .....	xii
Daftar Isi.....	xiii
Daftar Tabel.....	xvi
Daftar Gambar .....	xvii
Daftar Lampiran.....	xviii
Daftar Singkatan .....	xix
BAB 1 PENDAHULUAN .....	1
1.1 Latar Belakang .....	1
1.2 Rumusan Masalah .....	3
1.3 Tujuan Penelitian.....	4
1.3.1 Tujuan Umum .....	4
1.3.2 Tujuan Khusus .....	4
1.4 Manfaat Penelitian.....	4
1.4.1 Manfaat bagi subyek .....	4
1.4.2 Manfaat bagi masyarakat dan pelayanan kesehatan .....	4
1.4.3 Manfaat bagi ilmu pengetahuan.....	4
BAB 2 TINJAUAN PUSTAKA.....	5
2.1 <i>Coronavirus</i> .....	5
2.1.1 Klasifikasi <i>Coronavirus</i> .....	5
2.1.2 Struktur <i>Coronavirus</i> .....	6
2.2 COVID-19.....	7
2.2.1 Epidemiologi COVID-19 .....	7
2.2.2 Patogenesis dan Patofisiologi COVID-19.....	8
2.2.3 Manifestasi Klinis COVID-19 .....	12
2.2.4 Diagnosis COVID-19 .....	12
2.3 Ferritin.....	18
2.3.1 Sindrom Hiperferritinemia .....	20
2.3.2 Hiperferritinemia pada COVID-19 .....	22
BAB 3 KERANGKA KONSEPTUAL DAN HIPOTESIS PENELITIAN .....	26
3.1 Kerangka Konseptual.....	26
3.2 Hipotesis Penelitian .....	27
BAB 4 METODELOGI PENELITIAN .....	28
4.1 Jenis dan Rancangan penelitian.....	28
4.2 Tempat dan Waktu Penelitian .....	28
4.3 Populasi,Sampel dan Besar Sampel.....	28

4.3.1	Populasi .....	28
4.3.2	Sampel .....	28
4.3.3	Besar Sampel .....	29
4.4	Teknik Pengambilan Sampel.....	29
4.5	Variabel dan Definisi Operasional .....	29
4.5.1	Variabel .....	29
4.5.2	Definisi Operasional.....	29
4.6	Prosedur Pengumpulan Data .....	30
4.7	Pengolahan Data.....	31
4.8	Alur Penelitian.....	31
<b>BAB 5 HASIL PENELITIAN</b>	.....	<b>32</b>
5.1.	Karakteristik Penderita COVID-19 .....	32
5.2.	Kadar Ferritin Penderita COVID-19 .....	33
5.2.1	Kadar Ferritin dan Komorbiditas COVID-19.....	33
5.3.	Derajat Keparahan Penderita COVID-19 .....	34
5.3.1	Karakteristik Derajat Keparahan Penderita COVID-19 .....	34
5.3.2	Komorbiditas dan Derajat Keparahan COVID-19.....	37
5.3.3	Uji Normalitas Derajat Keparahan Penderita COVID-19 .....	38
5.4.	Hubungan Kadar Ferritin dengan Derajat Keparahan COVID-19 .....	38
<b>BAB 6 PEMBAHASAN</b>	.....	<b>40</b>
6.1.	Karakteristik Subjek Penelitian .....	40
6.2.	Kadar Ferritin Penderita COVID-19 .....	42
6.3.	Kadar Ferritin dan Komorbiditas Penderita COVID-19 .....	43
6.4.	Komorbiditas dan Derajat Keparahan COVID-19 .....	43
6.5.	Hubungan Kadar Ferritin dengan Derajat Keparahan COVID-19 .....	45
6.6.	Keterbatasan Penelitian.....	47
<b>BAB 7 KESIMPULAN DAN SARAN</b>	.....	<b>48</b>
7.1.	Kesimpulan .....	48
7.2.	Saran .....	49
<b>DAFTAR PUSTAKA</b>	.....	<b>50</b>
<b>LAMPIRAN</b>	.....	<b>55</b>

## DAFTAR TABEL

	Halaman
Tabel 2.1	Derajat keparahan COVID-19 berdasarkan WHO.....
Tabel 2.2	Spektrum sindrom hiperferritinemia .....
Tabel 5.1	Demografi dan karakteristik penderita COVID-19 .....
Tabel 5.2	Kadar ferritin pada penderita COVID-19 .....
Tabel 5.3	Kadar Ferritin dan Komorbiditas COVID-19 .....
Tabel 5.4	Hubungan antara kadar ferritin dengan komorbiditas COVID-19....
Tabel 5.5	Derajat keparahan COVID-19.....
Tabel 5.6	Karakteristik derajat keparahan pederita COVID-19 .....
Tabel 5.7	Komorbiditas dan derajat keparahan penderita COVID-19.....
Tabel 5.8	Hubungan komorbiditas dengan derajat keparahan COVID-19 .....
Tabel 5.9	Uji Normalitas Derajat Keparahan Penderita COVID-19 .....
Tabel 5.10	Kadar Ferritin dan Derajat Keparahan COVID-19 .....
Tabel 5.11	Hubungan antara kadar ferritin dengan keparahan COVID-19 .....

## **DAFTAR GAMBAR**

	Halaman
Gambar 2.1 Struktur <i>Coronavirus</i> .....	6
Gambar 2.2 Transmisi COVID-19 pada inang manusia .....	8
Gambar 2.3 Patogenesis COVID-19 .....	9
Gambar 2.4 Proses replikasi COVID-19.....	10
Gambar 2.5 Struktur Ferritin .....	18
Gambar 2.6 Pengaturan Ekspresi Ferritin .....	20
Gambar 2.7 Peran potensial ferritin selama infeksi COVID-19.....	23
Gambar 2.8 Infeksi COVID-19 dan disregulasi zat besi .....	24
Gambar 3.1 Kerangka konseptual penelitian .....	26
Gambar 4.1 Alur penelitian.....	31

## **DAFTAR LAMPIRAN**

	Halaman
Lampiran 1 Lembar Pengumpul Data.....	55
Lampiran 2 Pengolahan Data Statistik Subjek Penelitian.....	59
Lampiran 3 Keterangan kelaikan Etik .....	73

## DAFTAR SINGKATAN

ACE2	: <i>Angiotensin-converting enzyme 2</i>
ADCC	: <i>Antibody-dependent cellular cytotoxicity</i>
APC	: <i>Antigen presentation cells</i>
ARDS	: <i>Acute respiratory distress syndrome</i>
ASCs	: <i>antibody secreting cells</i>
ATS	: <i>American Thoracic Society</i>
BAL	: <i>Bronchoalveolar lavage</i>
CCR	: <i>C-C chemokine receptor</i>
CDC	: <i>Center for disease control and prevention</i>
CD	: <i>Cluster of Differentiation</i>
CCL	: <i>Chemokine (C-C) ligand</i>
CRP	: <i>C-Reactive Protein</i>
CXCL	: <i>Chemokine (C-X-C) ligand</i>
DAMPs	: <i>Damage-associated molecular patterns</i>
DNA	: <i>Deoxyribonucleic acid</i>
Gp	: <i>Glikoprotein</i>
Hb	: <i>Hemoglobin</i>
HCoV	: <i>Human coronavirus</i>
HE	: <i>Hem agglutinin-esterase</i>
HLA	: <i>Human leukocyte antigen</i>
HLH	: <i>Haemophagocytic lymphohistiocytosis</i>
ICTV	: <i>International Committee on Taxonomy of Viruses</i>
IDSA	: <i>Infectious Disease Society of America</i>
IFN- $\gamma$	: <i>Interferon gamma</i>
IL	: <i>Interleukin</i>
Ig	: <i>Immunoglobulin</i>
IRE	: <i>Iron response element</i>
IRP	: <i>Iron regulatory protein</i>
LED	: Laju endap darah
MAS	: <i>Macrophage activation syndrome</i>
MCP	: <i>Monocyte chemoattractant protein</i>
MERS	: <i>Middle East respiratory syndrome</i>
MHC	: <i>Major histocompatibility complex</i>
MODS	: <i>Multiorgan dysfunction syndrome</i>
NK	: <i>Natural killer</i>
NOS	: <i>Nitric oxide synthase</i>
PAMPs	: <i>Pathogen-associated molecular patterns</i>
PCR	: <i>Polymerase chain reaction</i>
PRRs	: <i>Pattern recognition receptors</i>
PSI	: <i>Pneumonia Severity Index</i>
RBD	: <i>Receptor-binding domain</i>
RNA	: <i>Ribonucleic acid</i>
ROS	: <i>Reactive oxygen species</i>
rRT-PCR	: <i>Real-time Reverse transcription polymerase chain reaction</i>
RSS	: <i>Reactive sulfur species</i>

SARS-CoV-2	: <i>Severe acute respiratory syndrome coronavirus 2</i>
sHLH	: <i>Secondary haemophagocytic lymphohistiocytosis</i>
SIRS	: <i>Systemic inflammatory response syndrome</i>
TB	: <i>Tuberculosis</i>
Th	: <i>T-helper</i>
TLR	: <i>Toll-like receptor</i>
TMPRSS2	: <i>Trans Membrane Protease, Serine 2</i>
TNF- $\alpha$	: <i>Tumor necrosis factor-<math>\alpha</math></i>
WHO	: <i>World Health Organization</i>