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Mortality Risk Assessment In Hospitalised Covid19 Cases With Special Reference To Common Ncds, A Retrospective Study.

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Abstract
Background *Covid19 is an recently diagnosed pandemic disease in which causative organism was novel corona virus i.e. SARS CoV 2. Covid19 is an highly communicable disease which had worst impact on world. In this situation many peoples are afraid and higher death is due to complications of age, comorbidities and etc. Data is collected from one of hospital of Covid Care Centre. In India the number of Covid19 Positive cases were huge, and this study is limited for single hospital therefore, this study is limited to find out overall impact of mortality risk in community with COVID-19 cases along with known non communicable diseases. Though this study can relate to community.*
Method *Retrospective observational study done in Covid19 hospital, and Sampling method was done Institutional based Cluster sampling from duration of 1st July 2020 upto 31 oct 2020 in Ojas Multispecialty hospital Ravet, Pune, Maharashtra. where case papers was studied as Selected where COVID-19 infection positive on basis of RTPCR positive, Covid19 antigen positive and with respect to HRCT thorax done, which presented Pneumonic ground glass opacity patch detected. As well as with and without non communicable diseases, 256 Case papers are studied who was admitted in for treatment Covid19 Positive. Four NCDs are taken among various non communicable diseases. Sample includes patients with Covid19 positive cases, age from 25 years to 99 years, patients who were admitted more than 24 hours. Exclusion done among cases with patient below 25 years, pregnant women, patients shifted to other hospital due to any reason.*
Result *Statistical analysis shows 20.31 % mortality are observed in covid19 patients among total mortality 96 % are observed as known NCDs. Cases with all NCDs Relative Risk is 1.55 , with DM - 4.67 HTN - 1.21 Cardiovascular Diseases – 2.90 and Renal Diseases – 4.46 Respectively. Indicates known history of NCDs are higher mortality risk.*
Conclusion *Death rate is higher in one or more number of known non communicable diseases with COVID19 infection are higher in risk of mortality. NCDs Reduces Immunity and Decreases the normal physiology of body. Which increase risk of Mortality.*
Key words *Covid19, SARS CoV 2, Diabetes Mellitus, Hypertension, Cardiovascular Disease, Renal Disease, Non communicable Disease.*

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I. Introduction

Covid19 is an recently diagnosed pandemic disease in which causative organism was novel corona virus i.e. SARS CoV 2 which was spread among all over the globe. Infection started in Nov 2019 in Whoohan city of China. Covid19 is a respiratory infectious disease which was an air born, infection spreads though Air, virus infects the alveoli of lungs in patient and develops pneumonic patches in different sites of lung parenchyma

Signs /Symptoms :-

Fever , Dyspnoea , Common cold , Dry cough , Generalised Weakness , in some cases Loose motions are also observed , In patients with comorbidities increases the chances of develops thrombus / emboli. Which increase the level of D-Dimer in blood.

Diagnosis :-

1. by covid19 antigen in blood 2. by RTPCR (reverse transcription polymerase chain reaction) to detect RNA of virus 3. by HRCT thorax (High definition computed tomography of Thorax) pneumonic ground glass opacity patches was visualised. Other are done to rule out complications of disease like- CBC,RFT,LFT,CRP, D-Dimer, Sr. Ferritin, IL6, etc.

Treatment:-

Currently Prevention is an only part of treatment, As guidelines given by government . to prevent infection. In an infected persons no proved treatment available till now, but some antivirals can administer as treatment part. Like tab Fabifavire, inj Remedesivir, inj Aceclovir, etc and symptomatic interventions are applied for result. Although total incubation period of virus is 20 days, Main object is to prevent the complications in infected patients.[1]

Non communicable diseases:-

Non communicable diseases (NCDs), also known as chronic diseases, tend to be of long duration and are the result of a combination of genetic, physiological, environmental and behaviours factors. The main types of NCDs are cardiovascular diseases (like heart attacks and stroke), cancers, chronic respiratory disease, Diabetes. Hypertension, Chromic / Acute Renal disease , Asthma , Carcinomas , Obesity , Etc NCDs disproportionately affect people in low- and middle-income countries where more than three quarters of global NCD deaths – 32million – occur. (WHO)[2]

Covid19 and DM relation:-

Definition of Diabetes Mellitus Diabetes mellitus is an metabolic disorder of multiple aetiology, characterised by chronic hyperglycaemia with disturbances of carbohydrate, fat and protein metabolism resulting from defects in insulin secretion, insulin action, or both. The long-term effects of diabetes include damage, dysfunction, and failure of various organs. People with diabetes are at increased risk of cardiovascular, peripheral vascular, and cerebrovascular diseases.[3] people with pre-existing medical conditions (such as diabetes, heart disease and asthma) appear to be more vulnerable to becoming severely ill with the COVID19 virus. When people with diabetes develop a viral infection, it can be harder to treat due to fluctuations in blood glucose levels and, possibly, the presence of diabetes complications. There appear to be two reasons for this. Firstly, the immune system is compromised, making it harder to fight the virus and likely leading to a longer recovery period. Secondly, the virus may thrive in an environment of elevated blood glucose.[4]

Covid19 and Hypertension:-

Hypertension, also known as high or raised blood pressure, is a condition in which the blood vessels have persistently raised pressure. Blood is carried from the heart to all parts of the body in the vessels. Each time the heart beats, it pumps blood into the vessels. Blood pressure is created by the force of blood pushing against the walls of blood vessels (arteries) as it is pumped by the heart. The higher the pressure, the harder the heart has to pump. Hypertension is diagnosed if, when it is measured on two different days, the systolic blood pressure readings on both days is ≥140 mmHg and/or the diastolic blood pressure readings on both days is ≥90 mmHg. (WHO)[5] A weaker immune system is one reason people with high blood pressure and other health problems are at higher risk for coronavirus. So it's less able to fight off the virus. Nearly two-thirds of people over 60 have high blood pressure. Another possibility is that the higher risk comes not from high blood pressure itself, but from certain drugs used to treat it -- ACE inhibitors and angiotensin receptor blockers (ARBs). The theory is based on the fact that ACE inhibitors and ARBs raise levels of an enzyme called ACE2 in body. And to infect cells, the COVID-19 virus must attach itself to ACE2.[5]

Cardiovascular diseases (CVDs) :-

CVDs are a group of disorders of the heart and blood vessels and include coronary heart disease, cerebrovascular disease, rheumatic heart disease and other conditions. Four out of five CVD deaths are due to heart attacks and strokes, and one third of these deaths occur prematurely in people under 70 years of age. Individuals at risk of CVD may demonstrate raised blood pressure, glucose, and lipids as well as overweight and obesity. Identifying those at highest risk of CVDs and ensuring they receive appropriate treatment can prevent premature deaths[6] In covid19 who had known CVDs , Myocardial injury is present in >25% of critical cases and presents in 2 patterns: acute myocardial injury and dysfunction on presentation and myocardial injury that develops as illness severity intensifies. Continuation of clinically indicated angiotensin-converting enzyme inhibitor and angiotensin receptor blocker medications is recommended based on the available evidence at this time. A number of promising treatments are under investigation, but none with proven clinical efficacy to date.[7]

Covid19 and Chromic / Acute Renal Disease:-

The term ‘acute kidney injury (AKI)’ has now replaced the previously used ‘acute renal failure (ARF)’ that described an illness with a sudden and rapid decline in renal function, causing retention of nitrogenous waste products such as blood urea nitrogen and creatinine. Clinically, AKI results in a failure to maintain fluid, electrolyte and acid-base homoeostasis and may be either non-oliguric (urine output >400 mL/day), oliguria (< 400 ml/day) or anuric (< 100 ml/day) Lower urine volumes are associated with more severe initial injury and

have implications for volume status, electrolyte imbalance and prognosis.[8] Definition of Chronic Kidney Disease (CKD) The presence of markers of kidney damage for more than 3 months, as defined by structural or functional abnormalities of the kidney with or without decreased glomerular filtration rate (GFR), manifest by either pathological abnormalities or other markers of kidney damage, including abnormalities in the composition of blood or urine, or abnormalities in 13 imaging tests; or 2. The presence of GFR less than 60 mL/min/1.73 m2 for more than 3 months with or without other signs of kidney damage as described above.[9] The clinical manifestations of renal involvement in COVID-19 can vary in severity from haematuria and/or proteinuria, acute kidney injury (AKI) and the need for renal replacement therapy (RRT, i.e. dialysis or hemofiltration)[10]

II. Result

TABLE : 1

Relative Risk	Cases
Sample Size	256
intervention event	50
Intervention non event	2
control event	171
control non event	33

Table – 2

DM	**Yes**	**No**	**Total**
A	47	5	52
B	124	80	204
Total	171	85	256

RR Diabetes Mellitus = 4.67

Table – 3

CVD	**yes**	**No**	**Total**
A	23	29	52
B	32	172	204
Total	55	201	256

RR Cardiovascular disease = 1.21

Table – 4

HTN	**Yes**	**No**	**Total**
A	33	19	52
B	118	86	204
Total	151	105	256

RR Hypertension = 4.90

Table – 5

Renal	**yes**	**No**	**Total**
A	25	27	52
B	19	185	204
Total	44	212	256

RR Renal Disease = 4.46

A :-death I.e. with event B :- non death I.e. without event. RR :-Relative Risk

III. Discussion

COVID-19 disease is a severely pandemic in all over globe, and it doesn't have any treatment due to which mortality risk increases throughout the time, as demographic count of COVID-19 positive cases increases and mortality rate increases too, according to some studies non communicable diseases are having higher risk of mortality. In known Renal Diseases like AKI / CKD who had low GFR and raised ACE which gives raise to blood pressure. As well as patients who doesn't had any known Renal disease they can develop AKI because of raised D-Dimer in blood level Which can develop Thrombus / emboli formation. Patients who are severe covid19 infection, due to pathological changes of developing tendency of thrombus / emboli formation this is critical condition of Mortality in known CVDs. In cardiovascular diseases are COVID-19 can cause, fulminant myocarditis associated with acute heart failure and cardiogenic, coronavirus cardiomyopathy can masquerade as ST-elevation myocardial infarction (STEMI), presenting with chest pain, dyspnoea and ST-segment elevations on electrocardiogram (ECG). As the all non-communicable disease are interlinked with each other like AKI / CKD and cardiovascular disease give rise to Blood pressure and which known as HTN which also interlinked with each other in Hypertensive cases. And Diabetes mellitus is an metabolic syndrome which alters normal metabolism in body which gives complications like Renal disease, cardiovascular disease, etc. HTN had lower percentage of mortality but in other NCDs patients who are known renal diseases, CVDs or DM cases observed that HTN is associated. In this study total COVID-19 positive cases are taken for study, which included with or without non communicable disease shows deaths are due to complications of non-communicable diseases due to its normal

physiological changes. Most of death are in severe pulmonary infection in covid19 with total lung collapse or due to multiple NCDs which give rises to complication in patients, At the end stage of patients cause of death was Acute respiratory distress was observed. Results of study shows 20.31% of death among 256 cases, patients who had one or more than one non communicable disease patient who doesn't have any non communicable disease had low mortality risk, in this research relative risk or ratio is 155 percent, Even though Non communicable disease with covid19 are Highly dangerous, Still with help of treatment it can be prevented which was observed in study But patients who was recovered they still faces post effect of covid19 disease. Previous researches study shows is the same result as compared his study. Literature which was reviewed shows the same result, which shows Covid19 positive patients who had known non communicable disease are in higher mortality risk. This study shows 155% higher risk of mortality then patient without non communicable disease, among these renal disease 446 %, cardiovascular disease 209%, diabetes mellitus 467% and hypertension is 121% . Logically prove covid19 virus or coronavirus is changing its Morphology and develops new Strains, Further research needed for best comparison of mortality rate in non communicable disease with COVID-19 infection.

IV. Conclusion

NCDs Reduces Immunity and decreases normal physiology of body. Which increases chances of Mortality. Relative Risk / Risk Ratio of Deaths, who had known NCDs was 155 % higher even with Treatment. All Theses NCDs are interlinked with each other. In this study patients who had Diabetes Mellitus are having higher percentage of mortality rate among other NCDs.

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