Diabetes Type II and Covid-19: Need of Rethinking

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Introduction

In the medical literature, the association between diabetes type II and COVID-19 has been analyzed several times [1-9] with almost the common finding that the disease is a risk factor for COVID-19 infection and death. The increase of ACE2 receptors in diabetic patients [2,4,6,] has been considered as one of the major causes, together with the inflammatory condition and insulin resistance which are common characteristics of diabetes type II [5,6]. Some authors were mentioning that the poorly controlled diabetes represents a risk factor for any infectious disease [8,9]. All these data, despite giving an important contribution to the understanding of the matter, most of the time are related to one country only.

In the following table are reported the data of 49 Countries in relation to the deaths for COVID-19 x 1000 people (updated to January 21st, 2021 [10]) and the ASDR (Age Standardized Death Ratio) for diabetes type II. ASDRs are measures of the disease's frequency in the countries and are purposely calculated to compare the data among countries [11] (Table 1). A significant negative correlation (r=-0.3008 p<0.05) was found between diabetes type II and COVID-19 deaths, which is exactly the opposite of the common believe.

Table 1: COVID-19 deaths x 1000 people and diabetes type II ASDRs.

Country	COVID-19 Death x 10³	Diabetes Type II ARDRs	Country	COVID-19 Death x 10³	Diabetes Type II ASDRs
Armenia	1.001	27.445	Kyrgyzstan	0.236	10.351
Australia	0.039	9.595	Latvia	0.516	10.894
Austria	0.851	14.181	Lithuania	0.831	5.006
Bahamas	0.475	28.002	Luxembourg	1.022	7.647
Belgium	1.845	5.623	Malta	0.574	15.493
Brazil	1.05	30.342	Mauritius	0.008	146.305
Brunei	0.007	52.972	Mexico	1.206	91.405
Canada	0.516	9.104	Netherlands	0.793	7.443
Chile	0.987	20.534	New Zealand	0.006	10.513
Croatia	1.107	17.474	Norway	0.105	5.989
Cuba	0.016	12.086	Republic of Chorea	0.026	13.898
Czechia	1.421	15.763	Moldova	0.812	8.708

Denmark	0.331	11.387	Romania	0.877	6.743
Estonia	0.269	5.378	Saint Vincent & Grenadinas	0.018	88.45
Finland	0.116	4.298	Slovakia	0.701	9.995
France	0.619	6.831	Slovenia	1.579	6.571
Germany	0.619	9.994	Spain	1.179	6.822
Grenada	0.009	78.995	Sweden	1.108	8.284
Guatemala	0.338	68.261	Switzerland	1.083	6.085
Hungary	1.186	13.283	Macedonia	1.325	29.982
Iceland	0.088	4.506	Trinidad and Tobago	0.099	115.584
Ireland	0.6	6.868	United Kingdom	1.477	4.169
Israel	0.501	20.99	USA	1.274	15.272
Italy	1.421	10.867	Uzbekistan	0.02	27.402
Japan	0.038	3.339	r COVID-19 VS Diabetes type 2	-0.3008 p < 0.05	

Limitations of the Study

The ASDRs of diabetes type II were those of the year 2016, because the WHO records are not updated (maybe they are, but data are not anymore publically available). However, the ASDRs correlations between values from 2000 and 2016 are very high (r =0.9641) which means that data of 2016 represent a reliable measure of 2020 also [12]. The cut-off of the statistical significance was settled to p< 0.05. This can be a further limitation, since in many studies the value of p< 0.01 is preferred which of course is more solid (personally I am used to choose this cut-off for correlations). However, no matter about the cut-of limit, the correlation of diabetes type II with COVID-19 death is negative and not positive.

Conclusion

A negative correlation was found with diabetes type II and COVID-19 deaths, meaning that the disease cannot be considered a threat for COVID-19. One may not rule out that a combination of aging, diabetes and other diseases can represent a risk for COVID-19 death. However, aging, and concomitant chronic illnesses increase the odds ratio of death for any disease.

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