ACE INHIBITORS AND ARBs AS RISK FACTORS FOR COVID-19 INFECTION: FAKE NEWS OR EVIDENCE-BASED MEDICINE?

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Background:
The new SARS-COV-2 infection has led the scientific world to experiment new therapeutic approaches and to define the factors that contribute to its onset, such as any chronic home therapies.
Social media often reported discordant news that induced confusion and that must be the subject of studies to define the truthfulness of the news.

Aim and objectives
The objective is to verify a correlation between Covid-19 infections and ACE-inhibitors and sartans (ARBs), used as chronic home therapies and to define them as risk factors.

Materials and methods
The retrospective observational case-control study compares 789 patients hospitalized from March-2020 to February-2021 at the COVID-hospital of Jesolo (VENICE) with severe Covid-19, with 789 disease-free patients.
The home drugs therapies were extracted from the database of pharmaceutical prescriptions (Datamanagement) in the year preceding the pandemic (Mar19-Feb20) and classified by ATC:C09A-C09B "Ace-Inhibitors" and C09C-C09D "ARBs". All data have been stratified by sex and age and statistically analyzed by odds ratio (OR), confidence interval (CI) and p-value, using Woolf method and approximated Z-test.

Category of drug	Hospitalized patients (case group)	Disease-free patients (control group)	Odds ratios with 95% Wald confident limits	p-value
Cardiovascular diseases	**522 (66,2%)**	**469 (59,4%)**	1,35 (1,10-1,66)	<0,05
ACE inhibitors	**220 (42,1%)**	**185 (39,4%)**	1,12 (0,87-1,44)	n.s.
ARBs	**128 (24,5%)**	**138 (29,4%)**	1,78 (1,31-2,42)	n.s.

Result
The study showed that patients who took drugs for cardiovascular diseases were more likely to become infected with Covid-19, respectively 66,2% vs 59,4% (OR:1.35, CI:1.10-1.66, p<0.01).
Patients taking ACE inhibitors were 42,1% vs 39,4% (OR:1,12; CI:0,87-1,44), therefore similar in number, without a statistical difference. Subgroups with combinations of diuretics or calcium channel blockers or other drugs also did not demonstrate a significant difference.
24,5% patients of the group of hospitalized patients took ARBs with or without associations, while in the control group the patients were more numerous, equal to 29,4% patients (OR:0,78; CI:0,59-1,03), with a statistically not significant difference.

ATC	Hospitalized patients (case group)	Disease-free patients (control group)	OR	IC	p VALUE
ACE INHIBITORS	**220**	**185**	1,12	0,87 - 1,44	> 0,05
C09AA: ACE - INHIBITORS NOT ASSOCIATED	**143**	**135**	0,93	0,71 - 1,23	> 0,05
C09BA: ACE - INHIBITORS AND DIURETICS	**58**	**45**	1,18	0,78 - 1,78	> 0,05
C09BB: ACE - INHIBITORS AND CALCIUM ANTAGONIST	**24**	**13**	1,69	0,85 - 3,36	> 0,05
C09BX: ACE - INHIBITORS AND OTHER ASSOCIATED	**12**	**6**	1,82	0,68 - 4,88	> 0,05
ARBs	**128**	**138**	0,78	0,59 - 1,03	0,082
C09CA: ARBs NOT ASSOCIATED	**80**	**72**	1	0,71 - 1,41	> 0,05
C09DA: ARBs AND DIURETICS	**42**	**61**	0,59	0,39 - 0,89	0,012
C09DB: ARBs AND CALCIUM ANTAGONIST	**14**	**13**	0,97	0,45 - 2,08	> 0,05

Conclusion
The analysis of the data shows that the number of cases between Covid-19 infection and ACE-inhibitors with/without associations is slightly higher than the control group, but there is no certain correlation with infection. While it appears that sartans are a protective drug as the control group has a slightly higher number of patients, there is still no certain correlation.
Therefore the study shows that there is no correlation between ACE-inhibitors, ARBs and Covid-19, and probably the infection is favored by cardiovascular disease or other pharmacological categories.

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