Introduction:
Coronavirus disease 2019 (COVID-19) has been spreading worldwide. Research conducted in different countries indicated this virus causes neurotropism and neurological symptoms development. The aim of this study is to analyse brain compliance (BC) of patients diagnosed with COVID-19 at intensive care unit (ICU) admission using non-invasive technique.

Methods:
Observational exploratory study conducted at the ICU of Hospital Beneficência Portuguesa in São Paulo, Brazil, including 14 patients with >18 years old with severe acute respiratory syndrome symptoms and positive COVID-19 confirmed by RT-PCR between 23 March and 4 April, a period in which the patients were included in the study. BC was monitored upon the admission through evaluation of changes in intracranial pressure (ICP) pulse, applying a non-invasive sensor (brain4care method, Brain4care© Corp., Brazil) based on the relationship between the amplitudes of the P1 and P2 peaks.

Results:
Morbidities were present in 50% and most patients were men with mean age of 57.9±12.1 years old. Glasgow coma Score, SAPS 3 and SOFA scales showed normal values in admission, however 13 of 14 patients presented changes in ICP waveforms, showing impaired brain compliance. Four patients appear to have the distribution of P2/P1 ratio above 1, while for others, the distributions are very close to 1. ICP pulses were used to calculate the P2/P1 ratio with a mean of 1.08, standard deviation of 0.24 and median of 1.02 in a total 258 observations, with approximately 20 observations per patient (figure 1). At the 0.05 significance level, the true mean value of P2/P1 is between 1.009 and 1.159. One P2/P1 ratio differs from the others and represents a patient with rheumatoid arthritis, on treatment with corticoids and hydroxychloroquine.

Conclusion:
Respiratory distress may produce BC impairment even in early development of this disease. This equipment may represent a tool for the early detection of neurological changes in these patients and help in decision-making.
Figure 1. Individualized boxplot analysis of all 14 patients in the admission in ICU.