SEX MODIFIES THE EFFECT OF COVID-19 AND PASC STATUS ON HAVING WORSE ARTERIAL ELASTICITY

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BACKGROUND Sex differences in immunological responses to COVID-19 infection and mechanisms that may contribute towards persistent symptoms consistent with post-acute sequelae of SARS-Co-V2 (PASC) have been reported. Independent of age, male sex have higher severity and mortality from COVID-19 infection compared to female sex while female sex is associated with higher risk of PASC. E evidence on the effects of COVID infection on vascular dysfunction and PASC are limited.

METHODS Study Participants ≥18 years of age were prospectively enrolled in this **adult cohort** if they were:

- SARS-CoV2 antibody negative and had no prior history of COVID-19 infection (**COVID-**), or
- COVID+ participants who were previously recovered but have no persistent or new active symptoms of PASC (**COVID+ no PASC**), or
- Prior documented COVID infection with presence of persistent symptoms attributable to PASC at least four weeks following infection (**PASC**).

❖Non-invasive, FDA approved **EndoPAT** (Endo-PAT2000) was used for endothelial assessment by post-occlusive reactive hyperemia arterial tonometry (RH-PAT).

❖*Arterial elasticity* was measured by **Augmentation Index** (*higher AI = worse arterial stiffness*) and standardized to 75 heart beats per minute (AI@75).

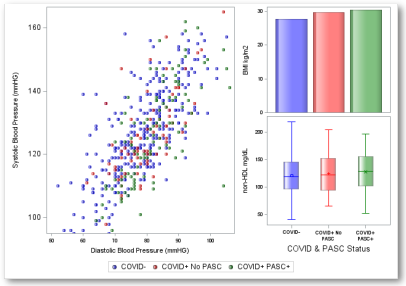


Figure 1: Characteristics of Study Participants

The effects of COVID and PASC status on arterial elasticity *depends* on sex. ***Female sex*** is associated with ***increased arterial stiffness*** (*worse arterial elasticity*) in the post-acute phase of COVID-19.

RESULTS

❖ **COVID+** [38.01% (n=187)]:

- 57.22% (n=107) were **female,**
- 31.72% (n=59) were non-white race,
- Average age was 46.64±13.79 years,
- 109 (22.15%) experienced PASC (**COVID+ PASC+**).

❖ **COVID-** [61.99% (n=305)]:

- 38.03% **female** sex,
- Lower BMI [27.76±5.89 kg/m^2 vs. COVID+ (30.79±8.95 kg/m^2); p<.0001],
- Higher proportion of smokers [58.22% vs. COVID+ (17.78%); p<.0001].

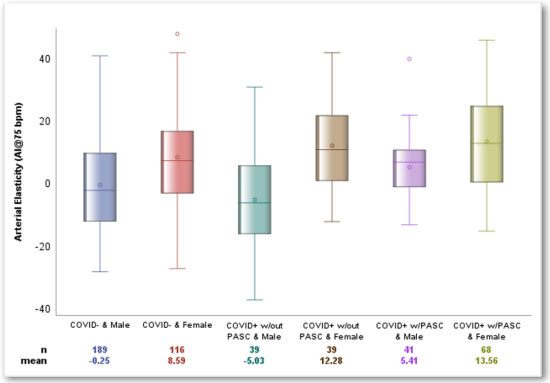


Figure 2: Distribution of AI@75 by COVID & PASC Status, and SEX

❖ AUGMENTATION INDEX @ 75bpm

- **COVID+ PASC+** (10.5±14.72),
- **COVID+ No PASC** (3.63±16.24),
- **COVID-** (3.11±15.97); p=0.0001.

- **Male** sex had lower AI@75 (-0.08±14.9) compared to **female** sex (10.75±15.3; <.0001).

❖ **COVID+ *PASC+, female sex*** (adjusted) had:

- 8.14 ± 2.95 *higher* AI@75 compared to ***COVID+ PASC+, male sex*** (p=0.006);
- 18.58 ± 2.99 higher AI@75 compared to ***COVID+ No PASC, male sex*** (p<.0001);
- 13.81 ± 2.11 higher AI@75 compared to ***COVID-, male sex*** (p<.0001); and
- 4.97 ± 2.28 higher AI@75 compared to **COVID-, female sex** (p=0.03).

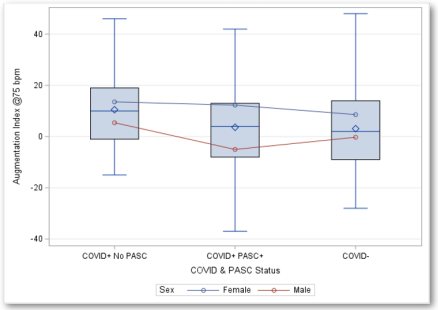


Figure 3: Modification of the effect of COVID and PASC status on AI@75 by Sex

CONCLUSIONS The effects of COVID & PASC on arterial elasticity is modified by sex. Convalescent COVID+ PASC+ female sex have worse arterial elasticity and are higher risk of cardiovascular events.

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