

INTRODUCTION

Measurement of the serological response to SARS-CoV-2 immunization is necessary to establish a correlation between vaccination response and effective protective immunity. This study aimed to determine the SARS-CoV-2 antibody titres between male and female adolescents who received the BNT162b2 vaccine.



METHODOLOGY

This was an observational cohort study. The participants were adolescents aged 12 to 17 years old who received the BNT162b2 vaccine for SARS-CoV-2 and had no previous history of COVID-19 infection. Blood samples were collected at seven different follow-up times. All blood samples were tested for SARS-CoV-2 anti-spike-IgG antibodies. Data was analysed using descriptive statistics and independent t-tests.

RESULT

- ✓ Out of 153 participants, 96 were included with a mean age of 14.18 ± 1.71 .
- ✓ 59.4% (n=57) were male and 40.6% (n=39) were female.
- ✓ The seropositive rate raised to 100% in both male and female at first dose follow-up and maintained until the end (12 months).
- ✓ Higher titres were seen in females [28.37 (20.27, 53.31)] compared to male [24.71 (12.42, 77.23)] at first dose follow-up. However, the differences in titers index were small.
- ✓ The upper limit of detection from 25th percentile and above [100.0 (100.0, 100.0)] were reached at completed vaccination and at month 3 follow-up in both sexes showed the protective titers was very high for both sexes.
- ✓ At month 6 to month 12 follow-up showed a trend of decreasing antibodies titres at 25th percentile ending with 100.0 (72.26, 100.0) in male and 100.0 (30.78, 100.0) in female.
- ✓ However, there were no significant differences between the antibody titres and sex at first dose [t(84)=0.127, p=0.900], completed dose [t(73)=-0.099, p=0.922], month 3 [t(67)=0.668, p=0.506], month 6 [t(58)=-0.395, p=0.694], month 9 [t(52)=-0.682, p=0.498] and month 12 [t(35)=0.476, p=0.568] of follow-up.

DISCUSSION

- Due to hormonal changes, it has been shown that there are sex variations in the immunological responses to adolescent immunisations; these sex-differential activities might become more apparent during puberty (1).
- Generally, testosterone has an immunosuppressive effect while estrogen has an immunoenhancing effect on the immune system (2).
- One of the reasons that may explain the sex bias in immune responses and a predominance of autoimmune disorders in women is gene diversity or dosage, which is many genes on X chromosome are associated with regulation of immune functions (2).
- There is limited evidence available about immunity following vaccination in adolescents. So, more research is needed in the future.

CONCLUSION

Vaccination generates strong immune responses and remains an important way to provide adolescents' host protection against COVID-19.

References

1. Sex-Related Differences in the Immune Response to Meningococcal Vaccinations During Adolescence. Milou Ohm, Anna G C Boef, Susanne P Stoof, Mariette B van Revenhorst, Fiona R M van der Klis, Guy A M Berbers, Mirjam J Knol. *Front Public Health*. 2022; 10:871670.
2. Sex Hormones Determine Immune Response. Veena Taneja. *Frontiers in Immunology*. 2018; 9:1931.

Seropositivity rate of SARS-CoV-2 IgG antibodies (Anti-spike-IgG) among adolescents by sex for BNT162b2 (Pfizer) vaccine based on follow up.

