

Serologic Testing for Celiac Disease and Gluten Intolerance in a Singaporean paediatric endocrine and growth clinic.

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INTRODUCTION

- In a Singaporean paediatric endocrine and growth clinic, many patients coming for a primary endocrine problem like short stature but often with gastro intestinal and other celiac disease related symptoms on systematic history taking, have had positive serology for celiac disease and gluten related disorders.
- Up to 10% of short stature has been estimated to be due to celiac disease. Celiac disease has been considered rare condition outside of the Western world but recent publications (Singh P, 2018, Yuan 2017) have shown that celiac disease is also present in Asians.
- While the Ttg-IgA test alone has hitherto been considered to be sufficiently sensitive to exclude celiac disease (CD) on its own, its sensitivity may have been over-estimated due to a failure to account for verification bias (Hujoel IA 2021). We have used a panel of 4 tests: Tissue transglutaminase (Ttg) IgA, Ttg IgG, and a combined test for Deamidated gliadin peptides (DGP) & Anti gliadin peptides (AGA) IgA and DGP / AGA IgG with Total IgA to screen for celiac disease and gluten related illness in our clinic population.

METHOD

- Over an 8 year period from 2012-2020, 456 patients (including 157 Singaporeans) presenting to a private paediatric endocrine clinic were found to be positive for one or more celiac serology tests as defined by kit manufacturer's standards (Euroimmun for Ttg-IgA, DGP IgA and DGP IgG using the Euroimmun gliadin-analogue fusion peptide (GAF-3X) tests and Orgentec for Ttg-IgG). All tests were performed at a single government hospital lab (TTSH CIL)
- Data about age, sex, ethnicity, birth history, growth velocity and systemic complaints, reports of school performance and pubertal status along with serial data for bone age, growth, puberty, thyroid and relevant concurrent or past illness were recorded in the course of clinical care and then checked to avoid duplications and omissions. All data is presented now in an anonymized form

RESULTS

What was the profile of the seropositive patients ?

- All 456 patients were positive for at least one serological test for celiac disease or disorders of gluten tolerance
- There were 243 males and 213 females. M : F = 1.13 : 1)
- Age range 0-59yrs but 395 (86.6%) were <19 yrs old
- The majority 292 (64%) were Asian**
 - 232 (50.4 %) ethnic Chinese
 - 40 (8.8%) Indians,
 - 22 (5%) Indonesian/ Malay,
 - 82 (18.4%) others.

Caucasians (80) comprised only 17.5% of the total

Why did they present for testing and investigation ?

Many but not all had GIT symptoms.

The vast majority came for growth problems ,

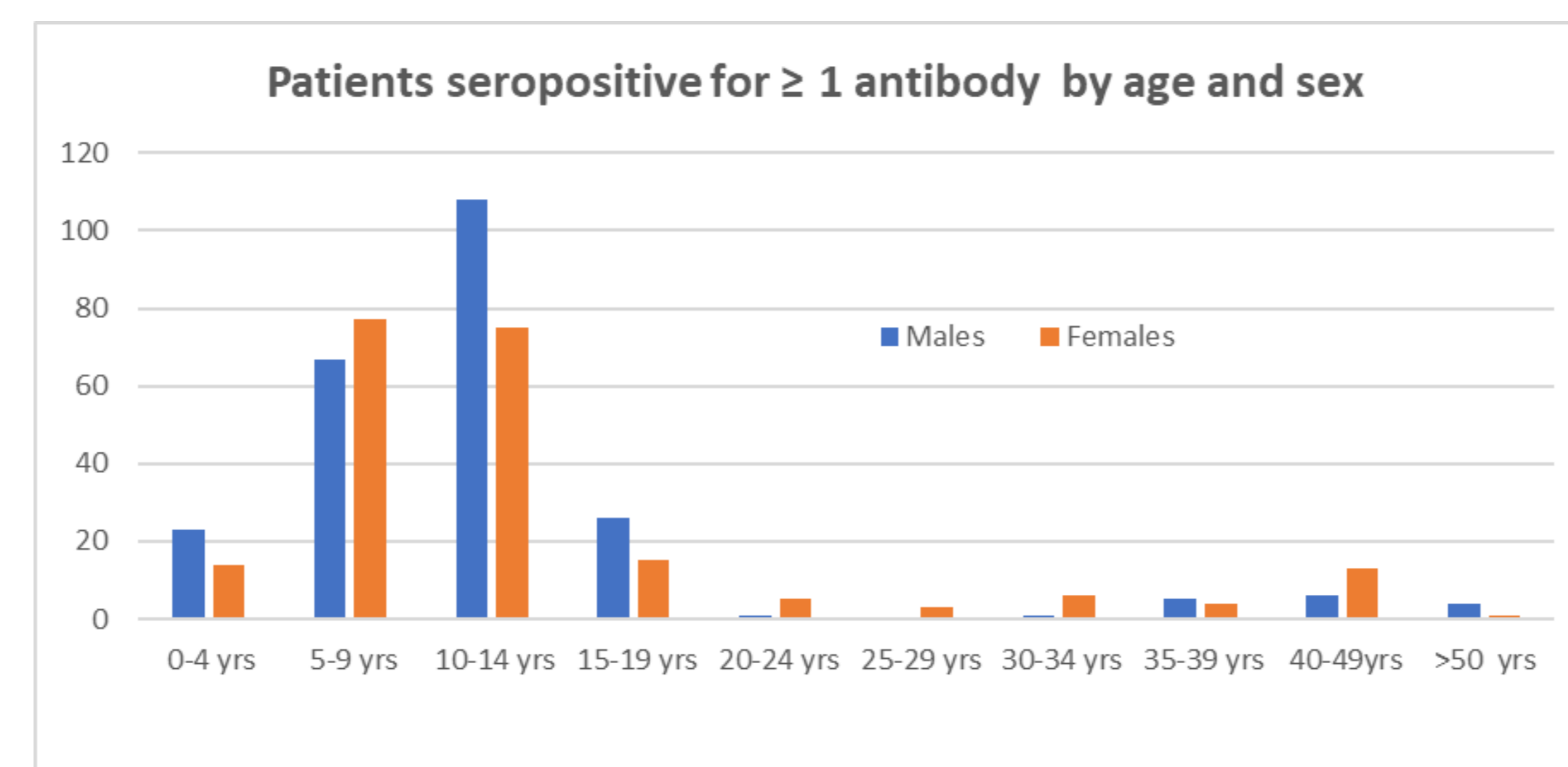
- 380 (83%) for short stature, growth faltering
- 34 had Type 1 diabetes mellitus
- 28 screened because of a positive 1st degree relative
- 14 presented for a thyroid condition.

Which antibody was most likely to be positive?

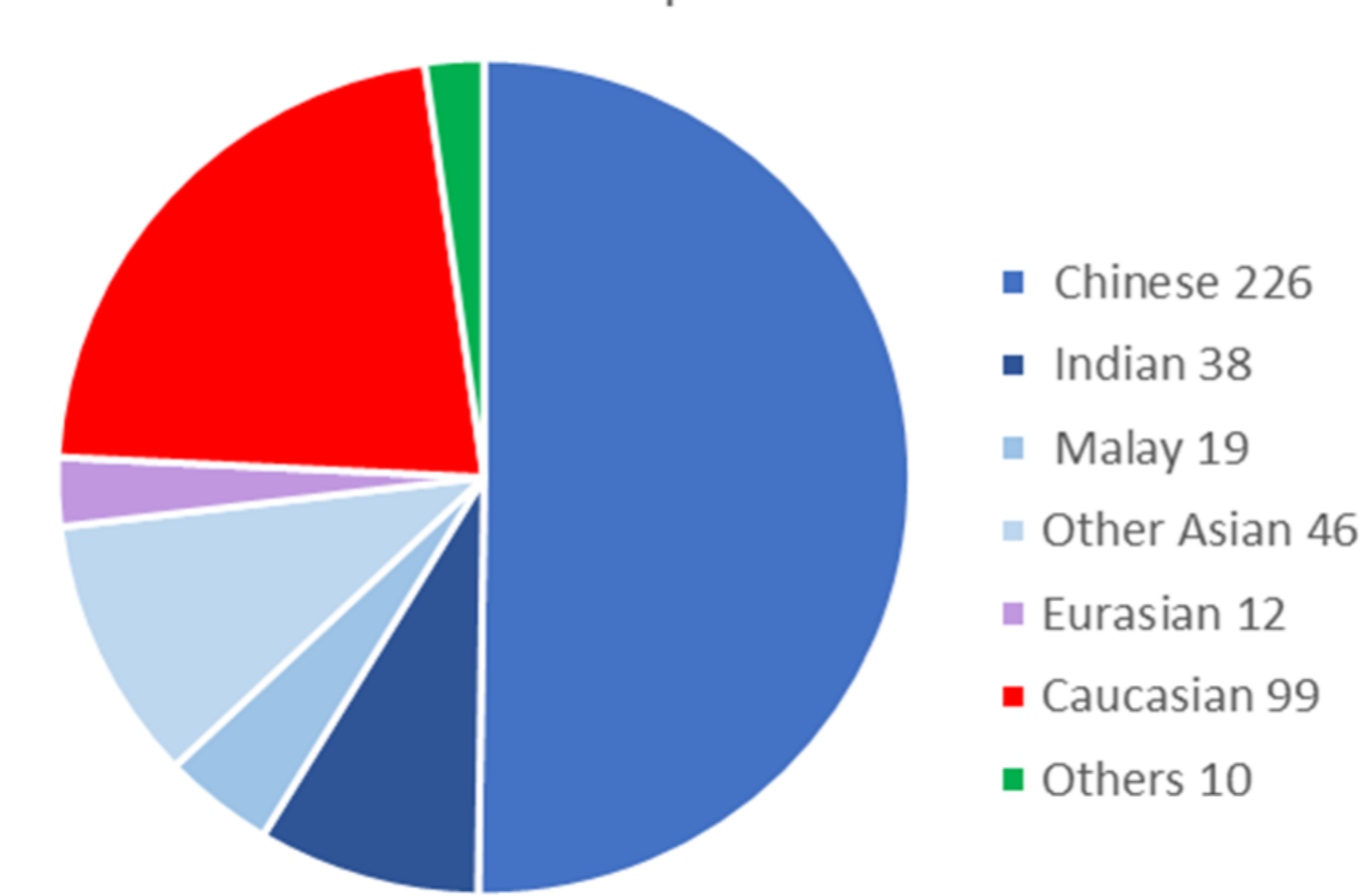
- Commonest was DGP /AGA IgA I+ve in 251(55 %)**
- tTg-IgG was next 217 (47.6%)**
- tTg-IgA was positive in only 115 patients (25.2%)**
- DGP/AGA IgG was least likely to be positive : 46 (10%)**

Were there patients positive for multiple tests ?

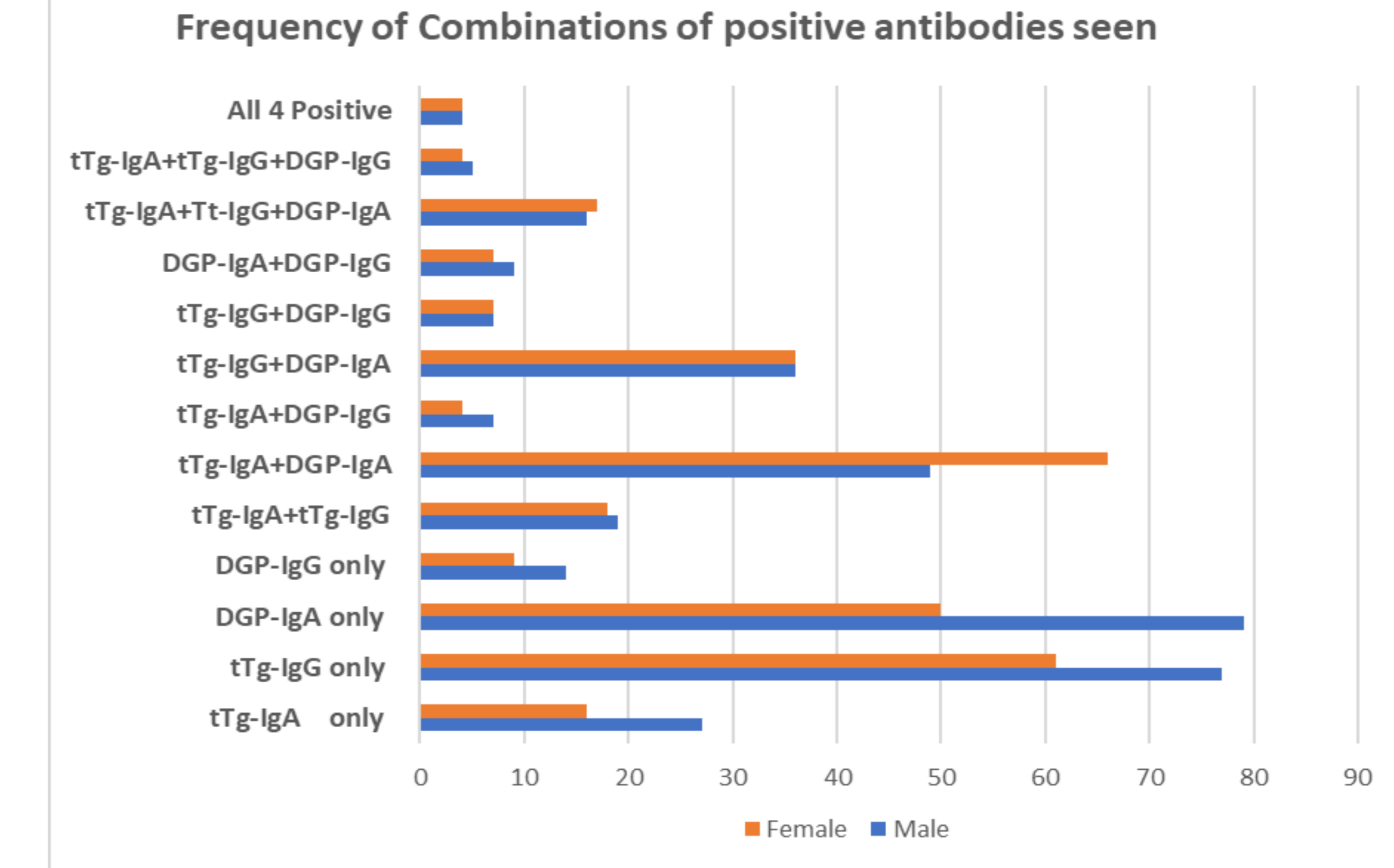
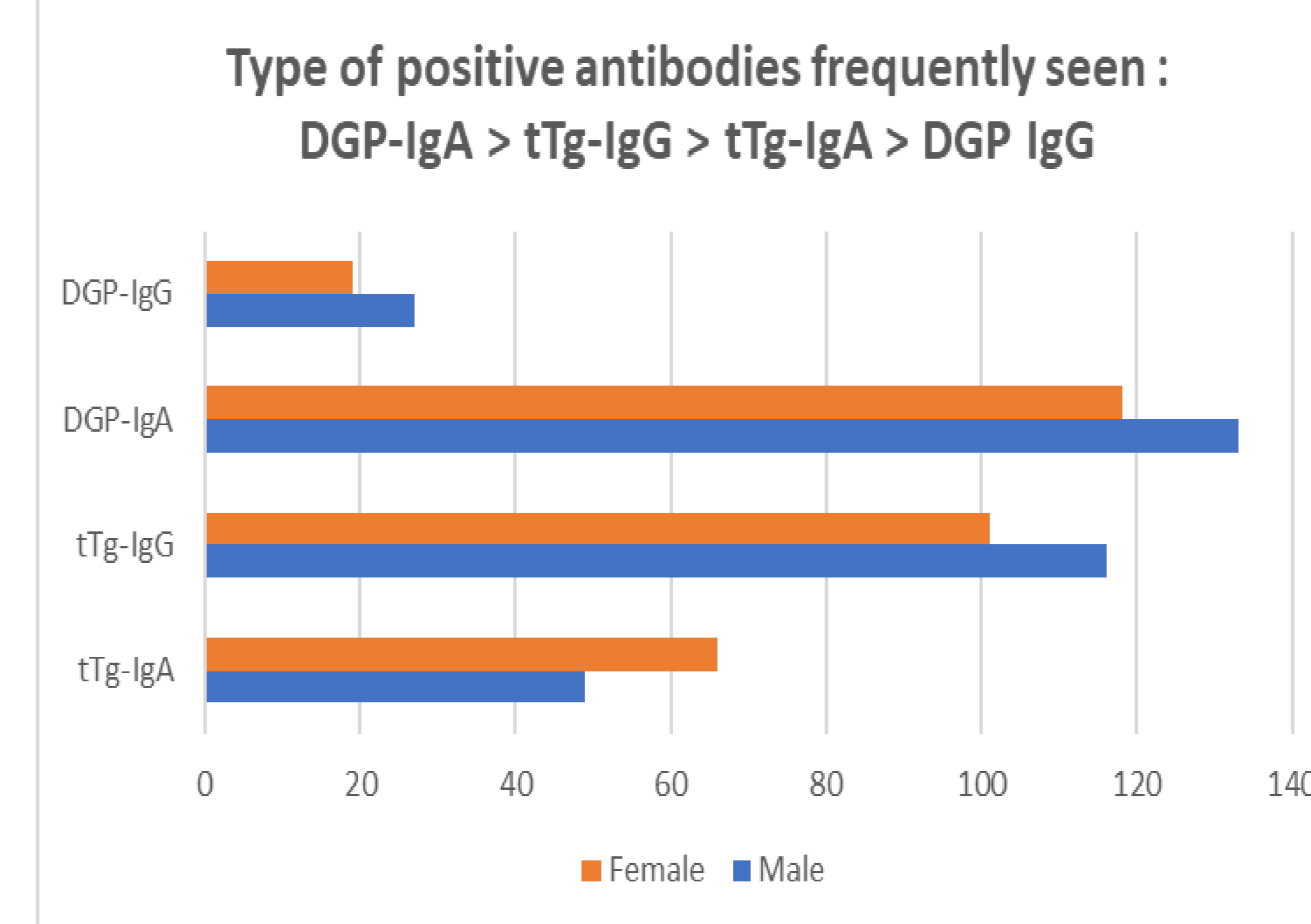
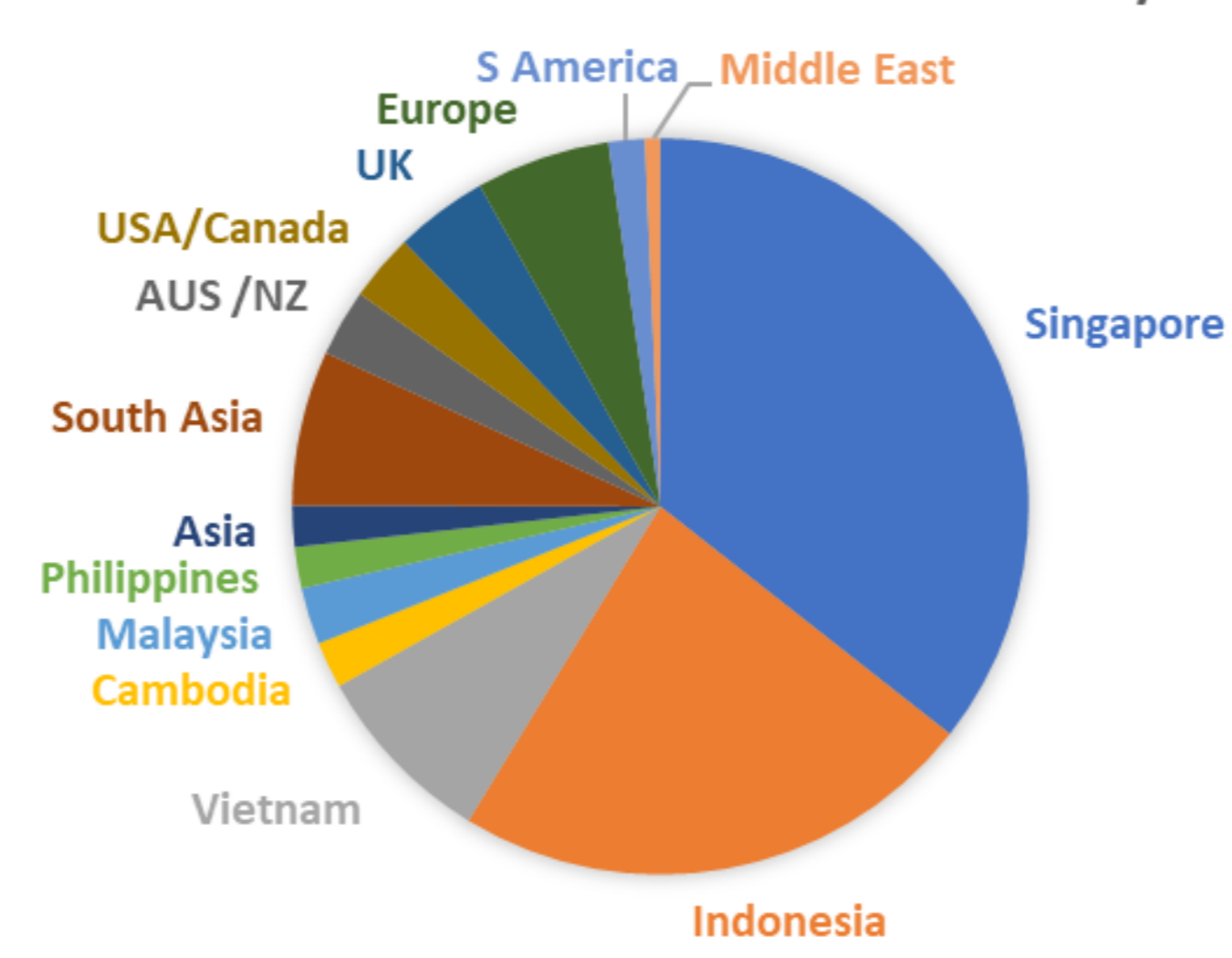
- 40 patients were positive for 2 antibody tests ,
- 18 were positive for 3 tests &
- 4 patients were positive for all 4 tests



Ethnicity of 456 Patients with at least 1 test positive

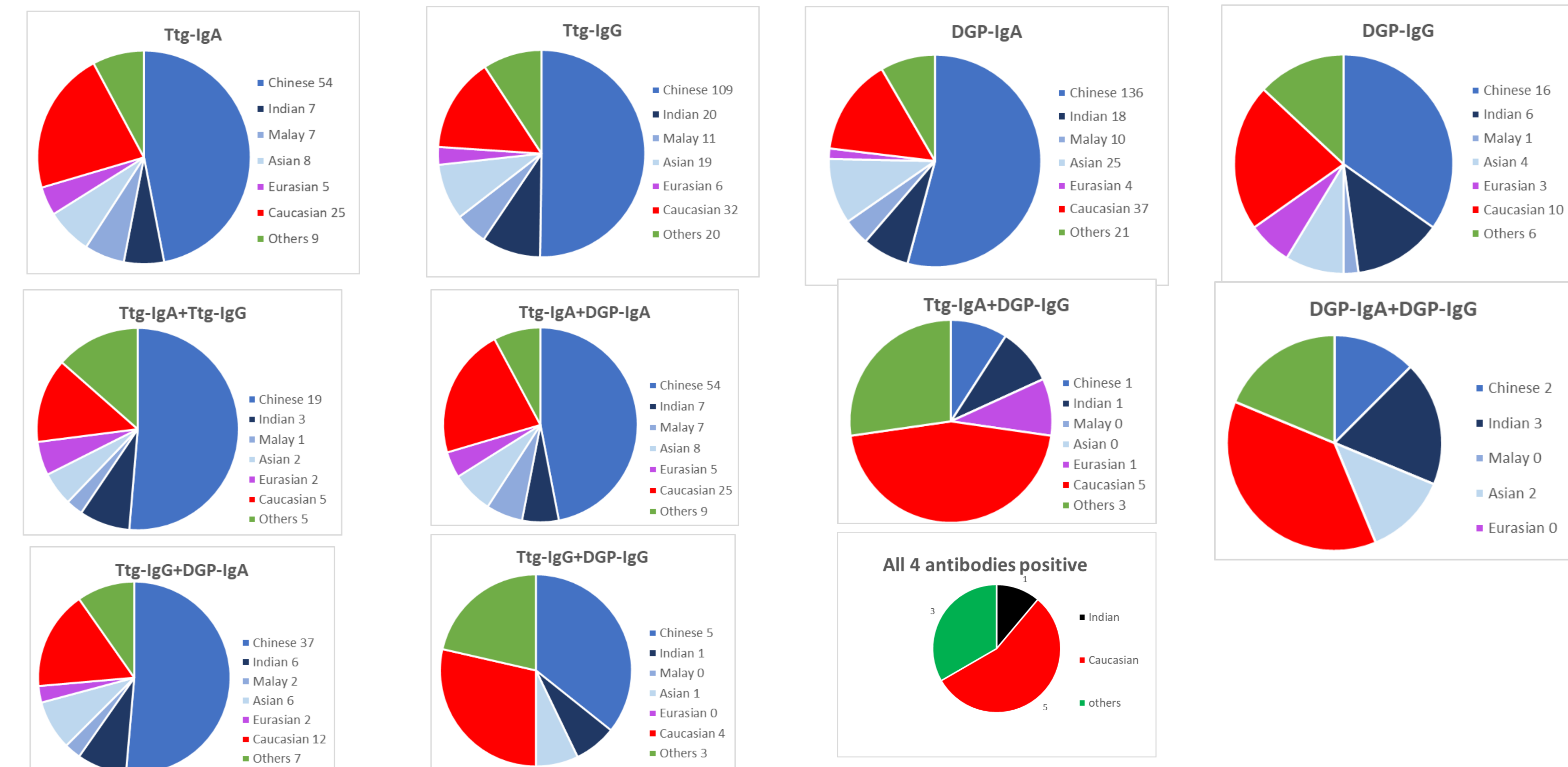


SEROPOSITIVE PATIENTS BY COUNTRY / REGION



Was there any difference in the patient profile vs type of antibody positivity ? YES

- Of 115 patients positive for Ttg-IgA, 98 (85%) were <19 yrs ; 71.5% were Asian (44% Chinese) and 23.5% were Caucasian
- Among 217 patients positive for Ttg-IgG, 50% were ethnic Chinese vs Caucasians (13%).
- There were 251 (55% of 456) patients positive for DGP IgA, (135 ethnic Chinese, 45 Caucasians)
- There were 46 (10 % of 456) positive for DGP IgG (of whom only 11 (2.4 % of 456) are Caucasians.



CONCLUSIONS

- Positive serological tests for celiac disease and gluten related illness are not uncommon in Singaporeans and Asians with disorders of growth ,puberty and thyroid illness.
- Tests should include Ttg-IgG, DGP IgA, DGP IgG and Ttg-IgA
- Celiac disease and disorders of gluten tolerance must be considered in Asian patients with short stature and T1DM

REFERENCES

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