

# Role of Thyroid Peroxidase Antibodies in the Outcome of Pregnancy

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## // AIM

### How does Thyroid Autoantibody status during pregnancy affect the outcome?

An effective ELISA format immunoassay kit has been developed and validated. This kit has been used in the clinical setting to assess the thyroid autoantibody status in a study of 2000 pregnant women over 3 years. The Thyroid status of the women was assessed and pregnancy has been followed up to determine whether the presence of high levels of Thyroid auto-antibodies have a negative impact on outcome.

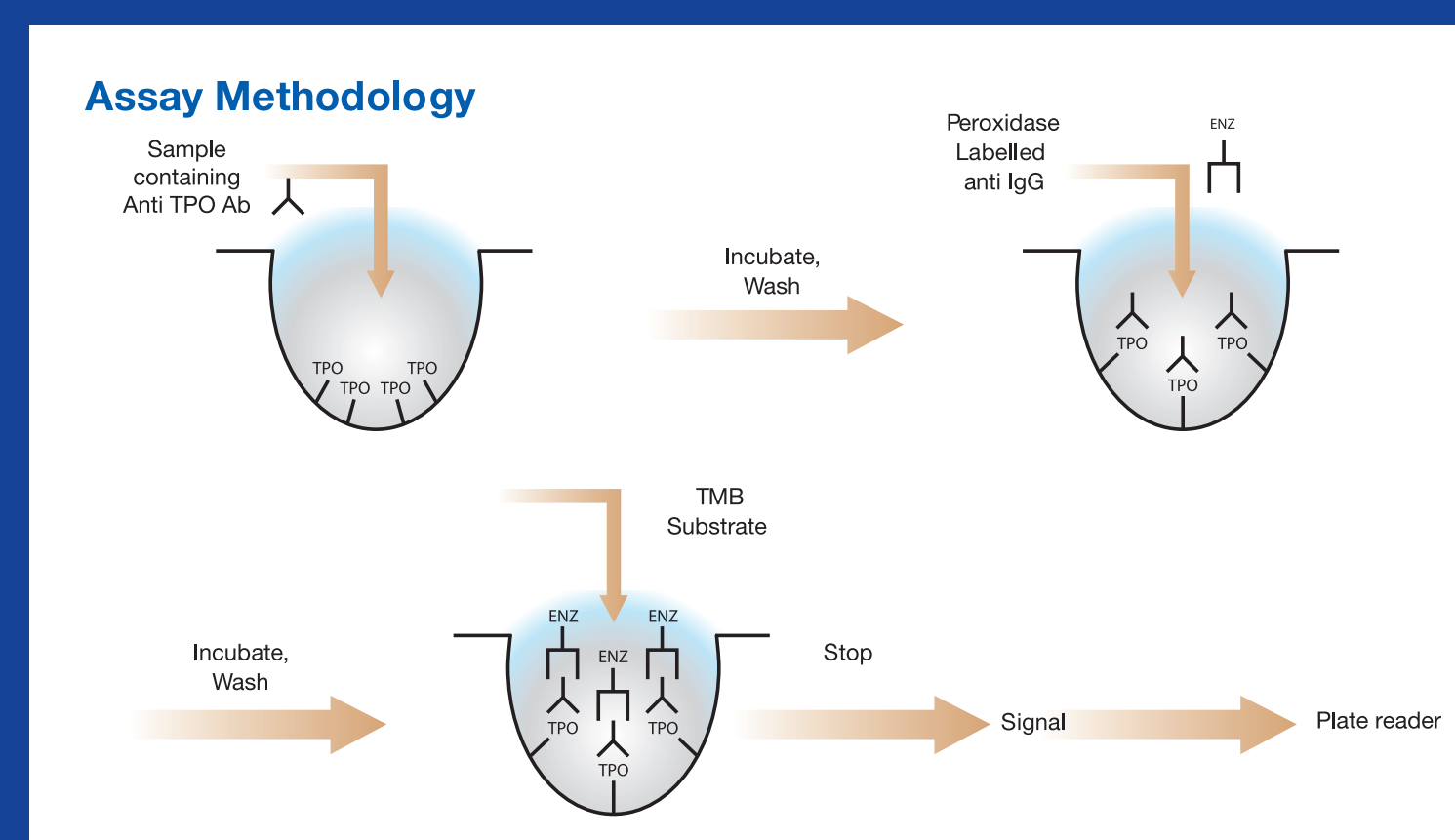
## // ASSAY DEVELOPMENT

### Principle

The assay was designed to be highly reproducible and stable despite a challenging environment. The assay relies on binding of human thyroid auto-antibody to immobilised TPO. Excess sample is washed away and a peroxidase labelled MAb to human IgG used to create the sandwich. A colorimetric signal is generated using TMB substrate. Assay standards from anti TPO positive serum were calibrated against the international reference preparation (WHO 66/387). An assay cut-off of 100U/L was used to distinguish positive from negative TPO auto-antibody samples.

### Production

Standard format flat bottom microtitre plates were coated with stabilised Thyroid Peroxidase (TPO, Scipac P184-4). Coated plates were further treated to minimise non-specific binding and were lyophilised for storage and subsequent use.

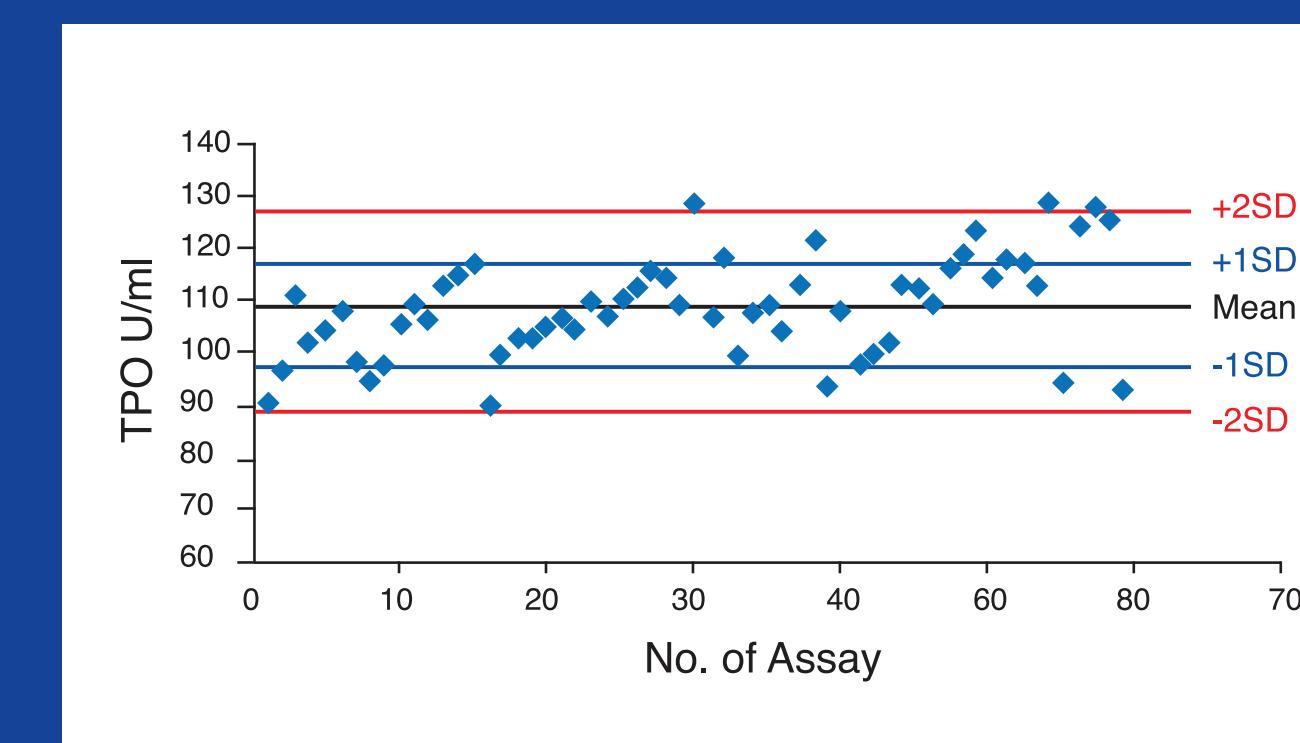
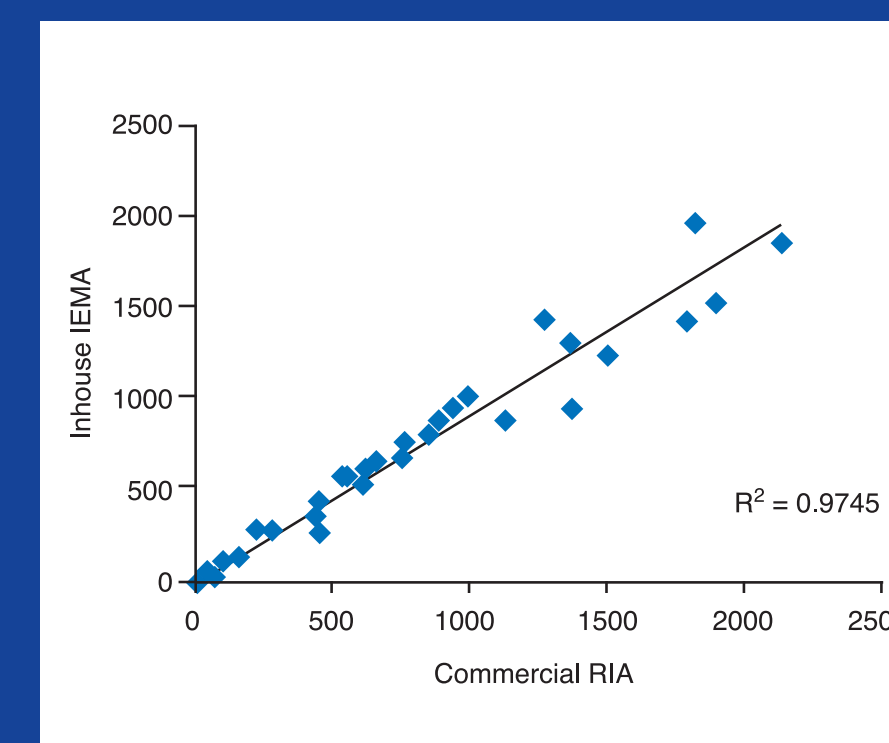


## // ASSAY VALIDATION

The assay was validated by comparison with the commercially available DRG RIA assay and the Serodia agglutination test kits using a range of patient samples. Correlation was  $r^2 = 0.975$  between the two methods. The laboratory participated in the UKNEQAS external quality assurance scheme during the 3 year duration of the study with zero reporting errors. The data from the IQC over the period of the study gave the following:

QC A mean 108 U/ml S.D.  $\pm 8.8\%$  (n = 58)  
QC B mean 340 U/ml S.D.  $\pm 5.0\%$  (n = 58)

## // CORRELATION & REPRODUCIBILITY



## // PREGNANCY STUDY

The thyroid status of 2291 pregnant women registered for antenatal care at the Shaikh Zayed Medical Complex, Lahore, Pakistan was assessed by measurement of TSH and free T4 levels in blood samples taken at presentation (second trimester, 14-20 weeks). All Euthyroid patients (1951) were included in the study, consent was obtained and a full medical history was recorded. The FT4, TSH and anti TPO status of each participant was assessed. All investigations were carried out in duplicate in batches with 7 calibrants and 3 controls

## // PREGNANCY FOLLOW UP

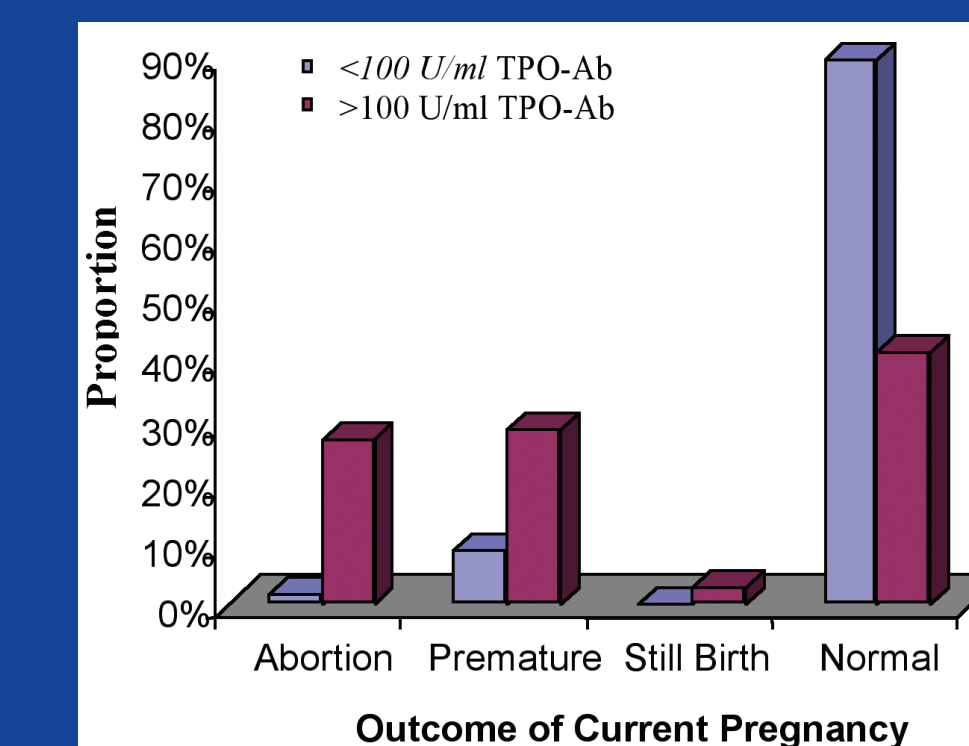
All participants were followed to assess the outcome of their pregnancy. Outcomes were categorised by the following criteria: spontaneous abortion, still birth, premature delivery and healthy baby. The progression of the healthy infants is being followed and will be the subject of further studies.

## // RESULTS

Euthyroid participants positive  $>100$ U/L for TPO auto-antibodies = 233.

Normal deliveries = 1634  
Spontaneous abortion = 90  
Premature births = 219  
Still births = 8

The data were further assessed by age group and TPO auto-antibody titre.



## // DISCUSSION

The outcome from pregnancy in patients with elevated levels of TPO autoantibody correlates with a poor outcome in pregnancy ( $>22\%$ ). This is in line with the smaller Belgian study by Glinoe et al. (1995) who came up with similar findings. This suggests that the inclusion of a TPO auto-antibody test when assessing the progression of pregnancy would be useful. Pregnancies where TPO auto-antibodies are detected should require more intensive monitoring and possible earlier intervention.