Is Food Intolerance a factor underlying Chronic Immune Thrombocytopenia (ITP)?

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Abstract

Immune Thrombocytopenia is an organ specific autoimmune disorder. It was believed that food intolerance may be a factor in ITP, affecting platelet count. This study investigated whether dietary modification could lead to an increase in platelet count in patients with ITP. IgE and IgG tests were conducted along with platelet counts to see if the role of food in ITP could be better understood. This study found that dietary modification did not affect platelet count in ITP patients. This suggests food intolerance does not cause chronic ITP.

Introduction

Immune Thrombocytopenic Purpura (ITP) is an organ specific autoimmune disorder (Karpatkin et al, 1980) characterised by a platelet count of less than 100 x 10^9/L (100,000/µL).

Anecdotal reports suggest that food intolerance may cause ITP but this has not been widely investigated. Some foods may produce an acute thrombocytopenia, however (Achtenberg and Vermeer, 2012).

IgE mediated allergy generally occurs within 2 hours of contact with the specific food. Food intolerance is a general term describing an abnormal physiological response to a foodstuff and is suggested when IgE allergy cannot be established yet symptoms still persist (Suen & Gordon, 2003).

IgG, may give information about sensitivities to foods (Zeng et al, 2013). IgG is produced in a delayed response to an infection and can be retained in the body for a long time due to high synthetic rate and a long half-life (Atkinson et al, 2004).

This study was conducted to investigate if there was a link between food intolerance and platelet count in ITP sufferers, and whether analysing platelet counts, IgE and IgG during dietary modification can contribute to an understanding of the role of food in ITP.

Methods

Participant recruitment

50 patients of either sex aged 18-65 years suffering from chronic primary ITP were recruited into this study as well as control group of 50 healthy volunteers aged 18-65. Further details, including exclusions are outlined in Batty *et al* 2016.

Dietary Modification

Participants positive for IgE underwent dietary modification, removing foods causing the IgE response from their diet for 4 weeks. A further group of ITP participants with the lowest platelet counts underwent dietary modification with the elemental E028 diet.

The Elemental 028 Extra diet (E028 – Nutricia, Trowbridge, UK), a nutritionally complete liquid formula and used in treating Crohn's disease (King et al., 1997) was administered to the volunteers in 250ml cartons, gradually over the first few days before completely replacing other food for a 4 week period.

Three control participants also took the elemental diet and it was taken for 5-8 days.

Blood sampling

Blood samples were taken before and after dietary modification for platelet counts and IgG analysis. ITP patients undergoing dietary modification had platelet counts analysed weekly. Healthy controls undergoing E028 dietary modification had their platelets counted at the start and end of the diet. Blood samples for IgE were initially tested for 5 common allergens (FX5 Test). Positive samples were tested for a further 43 specific foods to further identify any other responses. IgG testing was carried out using the Genarrayt® Microarray for 200+ food IgG sensitivities. In this test, a red (positive) response was above 30 arbitrary units, a yellow (borderline) response was 24-30 arbitrary units and a green (normal) response was less than 24 arbitrary units.

Results

As expected, initial platelet results analysed by Mann Witney showed a significant difference between ITP and healthy controls with a p-value of <0.00001 and a z-score of -6.98 (Figure 1)

Analysis of 42 ITP volunteers and 30 healthy controls, showed a positive IgE count for five ITP and three control subjects. The three controls took no further part in the study.

Of the 5 ITP volunteers with the positive total IgE, two left the study. The three remaining subjects had IgE responses to different foods. These subjects were instructed by the dietician as to how to remove those food sfrom their diets during the test period.

Figure 2 indicates the mean platelet count for each group over the period of dietary intervention and shows that no significant increase in platelet count was observed. Two patients on the E028 diet showed a slight increase in platelet count then a subsequent decline; all remaining patients had a decline in platelet count over the course of the E028 diet.

Platelet counts of the healthy controls were within normal range throughout the investigation.

IgG Analysis

A comparison of the responses of ITP volunteers and healthy controls to IgG before and after dietary modification showed similar IgG responses to the same foods. Cow's milk came up as the primary sensitivity, and both groups had a relatively similar mean arbitrary unit result (+/-3%). Response of

IgG antibodies to cow's milk has been previously shown to be a normal physiological response (Kletter et al, 1971).

Discussion

This study shows that dietary modification has no effect on platelet levels in people with chronic ITP or healthy controls. We conclude that food intolerance is not a factor in immune thrombocytopenia. ITP patients with positive IgE tests undergoing dietary modification did not show an improvement in symptoms or platelet counts either during or after the diet. IgE was not analysed at the end of the modification period so it's inconclusive whether the overall response to IgE and to those specific foods had changed.

Of the IgG response to 200+ foods tested for, ITP volunteers and healthy controls had varied responses and many controls also had a number of red and yellow responses. Results are inconclusive when trying to identify food intolerance from IgG results.

Because of IgG's natural protective response, this suggests a response to stimulation of the immunoglobulin occurs without clinical symptoms (Mullin et al 2010). These results suggest when the gut is persistently exposed to certain food proteins, it responds with the production of IgG but does not necessarily create a sensitivity to it. The findings in this study, however, show that that IgG tests for food intolerance are difficult to interpret.

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Authorship Contributions

Paper written, analysis of samples and data conducted by Claire Batty. Patient sampling and editing of paper by John Hunter. Dietary consultation by Jenny Woolner. Haematology work up and editing of paper by Trevor Baglin. Data analysis and editing of paper by Claire Turner.

Disclosure of Conflicts of Interest

No conflicts of interest noted

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Figure Legends

Figure 1 – Box and Whisker plot showing initial platelet counts of ITP sufferers and healthy controls

Figure 2 – Mean platelet count over time of both IgE and elemental diet modification groups

Figure 1

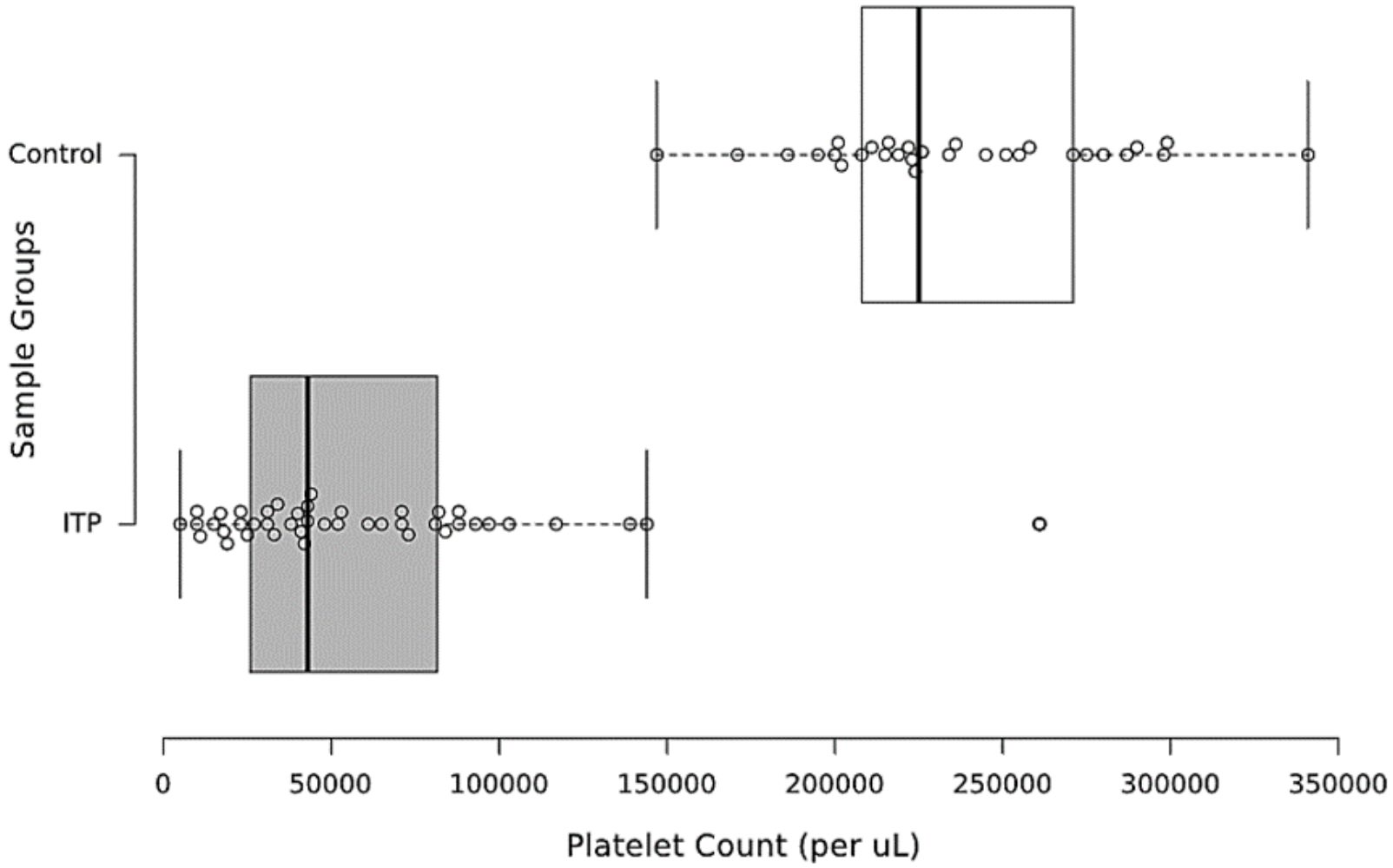
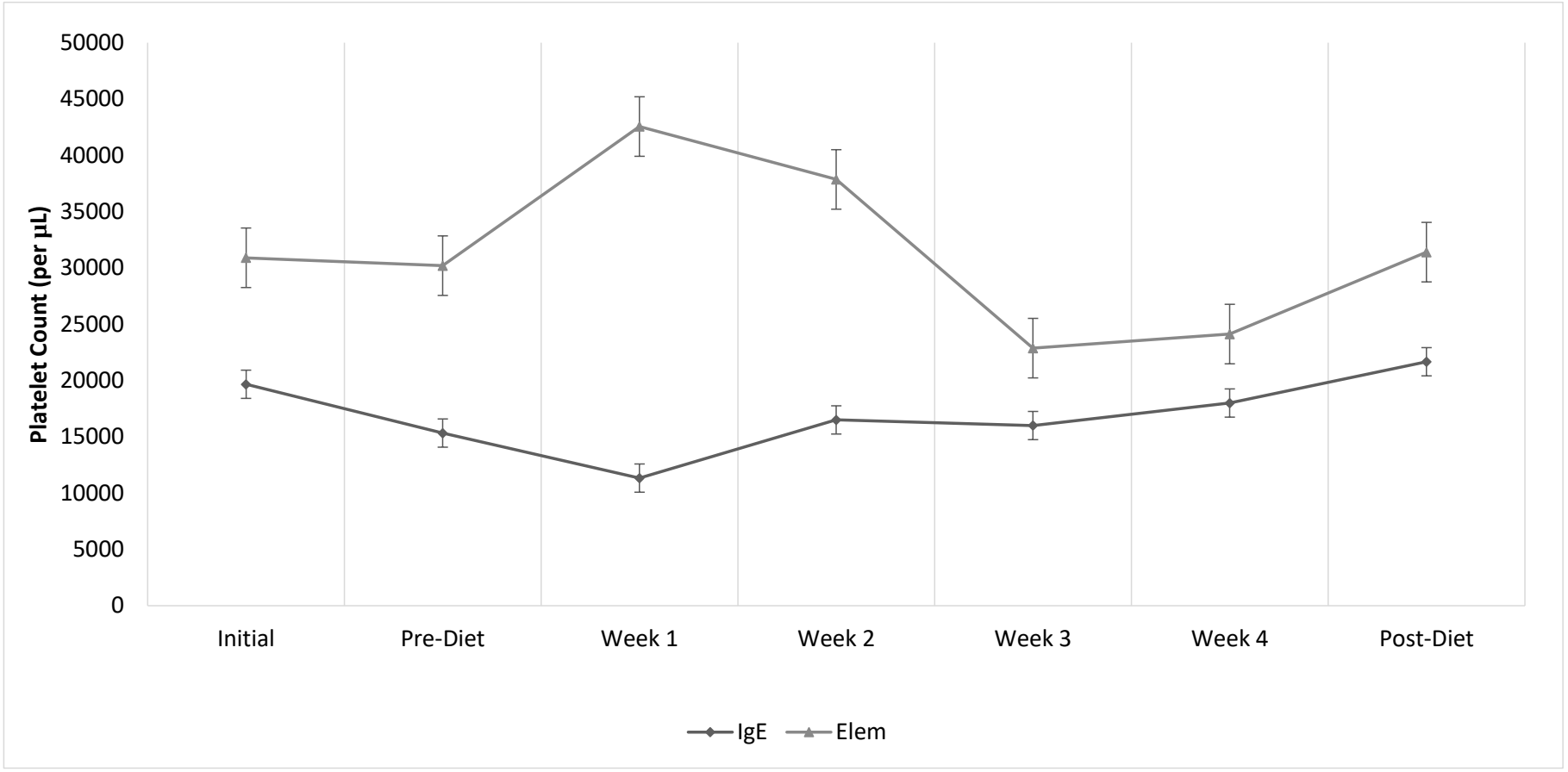

Control
ITP
Sample Groups
0
50000
100000
150000
200000
250000
300000
350000
Platelet Count (per uL)

Figure 2


50000
45000
40000
35000
30000
25000
20000
15000
10000
5000
0
Platelet Count (per µL)
Initial
Pre-Diet
Week 1
Week 2
Week 3
Week 4
Post-Diet
IgE
Elem