Relationship between serum trough infliximab levels, serum antibodies to infliximab, serum albumin levels and clinical response to infliximab treatment in patients with inflammatory bowel diseases

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A better understanding of the relationship between serum infliximab trough levels (S-IFX) and disease characteristics may lead to more effective use of this treatment in inflammatory bowel disease (IBD) patients. S-IFX has a wide inter-individual variability. The objective of this study was to determine the possible association of infliximab disposition with the formation of serum antibodies to infliximab (S-ATI) and serum albumin levels (S-ALB).

Background

Eighty five patients with IBD receiving infliximab treatment were included in this retrospective study: 31 with ulcerative colitis (UC) and 54 with Crohn’s disease (CD), 37 males and 48 females, with the mean age 36 ± 12 years. All patients were given intravenous infusions of 5 mg/kg of infliximab at weeks 0, 2 and 6 during induction treatment regimen and after that, if response was achieved, maintenance therapy with the dose of 5 mg/kg was continued every other month. Sixty three patients (74 %) were evaluated as responders to the treatment, twelve patients (14 %) developed secondary non-response in the course of the treatment, and 10 (12 %) patients have experienced adverse effect of the treatment.

Serum samples of these individuals from the IBD blood bank from second (W2) and fourteenth (W14) week of treatment were assessed for S-IFX, S-ATI and S-ALB. Measurement of S-IFX and S-ATI were determined by enzyme linked immunosorbent assay (Matriks Biotek), albumin was detected by colorimetric BCG assay (Roche–Modular).

Different groups were compared by the Mann-Whitney U-test or a two-sided Kruskal-Wallis non-parametric test. The Spearman rank test was used for correlations between variables. The threshold for significance was set at p < 0.05.

Results

S-IFX levels at W2 were significantly lower compared to W14 values (p = 0.016), see Figure 1.

S-ATI were positive in 8/85 (9 %) patients at W2 and 14/85 (17 %) patients at W14. Moreover, absolute values of ATI concentration were higher in W14 samples (p = 0.018).

S-ATI were significantly more frequent in samples with non-detectable S-IFX (p = 0.041) regardless of the week of the treatment, see Figure 2.

S-ATI achieved the highest values in the group of patients with adverse effects of the treatment (p = 0.01).

S-ALB levels were significantly lower at W2 compared to W14 (p = 0.0008). Strong positive correlation between S-ALB and S-IFX was found (r = 0.39, p < 0.0001), see Figure 3.

No differences in S-IFX were found in relation to the age, gender or diagnosis.

S-IFX levels in responders were significantly higher compared to secondary non-responders at W2 and W14 (p = 0.011 and p = 0.0006, respectively) as well as to patients with adverse effects of the treatment (p = 0.03 and p = 0.01, respectively).

Conclusions

S-IFX correlate with the clinical response to treatment with infliximab and S-ALB levels, whereas positive S-ATI are connected with adverse effect of the treatment and occur in sera without detectable S-IFX. This study indicates that patients with starting lower albumin levels might benefit from higher dosages of infliximab or shorter dosing intervals.

This work was supported by grant GAUK 69810 from Charles University in Prague.