Predictors of response to Infliximab in children with luminal Crohn's disease☆

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Abstract

Objective: A significant proportion of patients with initial response to Infliximab (IFX), subsequently lose response (LOR). Multicentre paediatric studies report LOR in 33% to 50% with 3–5 year follow-up. Our retrospective study examined durability of response and predictors of LOR.

Methods: From our IBD database of 185 children with CD, 65 received IFX maintenance therapy for luminal or fistulising Crohn's disease between January, 2006 and April, 2013. 47 with luminal CD ≥ 1 year follow-up after commencing IFX were included. We evaluated variables associated with response and describe outcomes on those remaining on IFX at four time points; before IFX, after induction, at 1 year and at the last follow-up. Response was divided into sustained primary, recovered, durable (combined sustained primary and recovered) and complete LOR (discontinuation from LOR or intolerance).

Results: Overall, 28/47 (60%) children sustained primary response over a median duration of 2.83 years (1.6–4.4, IQR). 19/47 (40%) developed LOR (including 2 intolerant) at a median of 11 months (9–23, IQR). Of 17 with LOR, 7 were successfully re-induced giving durable response (35/47, 74%); 6 failed dose intensification needing surgery (n = 2), second anti-TNF (n = 2) or both (n = 2). 4 had surgery without dose intensification. LOR was associated with low BMI at diagnosis, lower height Z scores prior to induction, elevated CRP following induction (p = 0.007) and failure to use concomitant IM (p = 0.02).

Conclusion: The cumulative probability of durable response to IFX in luminal CD was 83%, 74% and 70% after 1, 2, and 3 years on IFX maintenance therapy.

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1. Introduction

Crohn's disease (CD) is a chronic, debilitating gut disorder affecting growth, well-being, education, and employment and nearly 25% of patients are diagnosed before 16 years of age.
age. Paediatric onset CD is a more severe phenotype with the additional issues of growth failure, delayed puberty, reduced bone density and the consequences of a chronic disease commencing at a vulnerable period of psychosocial development.\textsuperscript{4-7} Cohort studies comparing the clinical course of paediatric vs. adult onset CD confirms a more aggressive nature with extensive intestinal involvement, rapid progression and increased disease activity index, year by year, despite use of more immunosuppression.\textsuperscript{8-10} The efficacy of Infliximab (IFX) for the maintenance of short and long term clinical remission in paediatric CD is well documented. However, a significant proportion of patients who initially respond to treatment, subsequently lose response (LOR) experiencing flare of symptoms.\textsuperscript{11} In adults with CD, LOR affects 13\% per patient year and associated with longer disease duration (>2 years), strictureing behaviour, smoking, high CRP, concomitant steroids & small bowel involvement.\textsuperscript{12,13} Paediatric data from US and Europe multicentre cohort studies have observed loss of response to IFX in 33\% to 50\% with 3–5 year follow-up, with almost 50\% requiring dose intensification (increased dose or frequency) during maintenance therapy.\textsuperscript{14-17} The heterogeneity in study design and definitions of loss of response, the differences of induction therapies and IFX eligibility criteria internationally all demand the need for a specific appraisal of IFX outcomes in our cohort of Australian children. There are no published Australian data on long term safety and efficacy of IFX therapy in paediatric CD. The purpose of our retrospective single centre cohort study was to examine the durability of response and predictors of loss of response to IFX.

2. Material and methods

2.1. Patients and study design

The Brisbane Paediatric Inflammatory Bowel Disease database has been a major initiative for collecting IBD data both retrospectively and prospectively since 2005, as part of an ethically-approved longitudinal audit of the natural history and genetics of CD and UC at Royal Children’s Hospital (RCH). RCH is a tertiary paediatric referral hospital providing services to Queensland and northern New South Wales with an estimated population of children (under 15) of 1 million. From our IBD database of 185 children with CD, we identified 65 patients who received IFX maintenance therapy for luminal or fistulising Crohn’s disease between January, 2006 and April, 2013. IFX was accepted on the Pharmaceutical Benefits Scheme (PBS) for Australian children aged 6–17 years with confirmed CD in 2007 and access restricted to those with: complex perianal fistulising disease, Paediatric clinical disease index activity (PCDAI) \( \geq 30 \) having failed adequate conventional therapy unless contraindicated. Conventional therapy is defined as 8 weeks of Exclusive Enteral Nutrition OR 6 weeks of tapering 1 mg/kg prednisolone AND \( \geq 3 \) months of Imuran \( \geq 2 \) mg/kg/day OR 6-mercaptopurine \( \geq 1 \) mg/kg/day OR methotrexate \( \geq 10 \) mg/m2. Approval to continue IFX is restricted to those with \( \geq 15 \) base points improvement in PCDAI with total \( < 30 \) or marked reduction (\( \geq 50\% \)) in drainage or number of open perianal fistula assessed 4–6 weeks after third induction dose IFX. IFX dose of 5 mg/kg to the nearest 100 mg was permitted under PBS criteria in addition it also requires six monthly prospective clinical and laboratory reporting for maintaining ongoing eligibility. This and other phenotype data including patient characteristics: endoscopy, radiology, biochemistry, concurrent treatments and outcomes were retrieved from our prospectively collected IBD database. Children with primary response to IFX for luminal CD and at least 1 year follow-up after IFX commencement were included. The aims of our study were to evaluate clinical and treatment related variables associated with IFX response and loss of response and quantify clinical outcomes on those remaining on IFX at four time points; before IFX, 4–6 weeks following IFX induction, at 1 year and at the last follow-up. We have used standard definitions but modified and enlarged these definitions for clarity of assessment.

Study definitions:

1. **Infliximab response** was defined as an improvement in symptomatic inflammatory activity (\( > 15 \) point drop in PCDAI/PCDAI < 30 with or without normal CRP < 5 mg/L).

Primary response to induction therapy was assessed at 4–6 weeks after 3rd dose IFX (0, 2, 6 weeks).

Primary non-response: was defined as no improvement in symptomatic inflammatory activity at 4–6 weeks after 3rd induction dose.

Secondary loss of response: was defined as symptomatic inflammatory relapse (PCDAI > 30 with elevated CRP or Calprotectin and/or endoscopically or radiologically confirmed relapse after successful primary response.

This was further subdivided into recovered response (those recovering response after IFX dose intensification) or complete loss of response as discontinuation due to intolerance or failure to recover response after dose intensification and requiring second anti-TNF agent or surgical excision or both.

Sustained primary response: was defined as clinical response on IFX maintenance not requiring dose intensification, surgical excision or second anti-TNF use.

Durable response was defined as the combination of sustained primary response and recovered response, successfully maintained on IFX.

2. Steroid use

Steroid free remission: no concurrent steroids to maintain clinical remission.

Steroid dependency: \( > 3 \) months \( \geq 0.5 \) mg/kg day or \( 10 \) mg/day prednisolone or clinical relapses within 3 months of tapering steroids.\textsuperscript{18}

3. Clinical characteristics

Clinical phenotype was defined using Modified Montreal/Paris classification. Height \( Z \) scores \( \leq 1.64 \) corresponding to \( < 5\% \) percentile was denoted as the presence of growth failure.\textsuperscript{5,19} BMI \( Z \) scores were calculated using Center for Disease Control (CDC) growth charts and BMI \( Z \) scores \( < -1 \), \( \leq -2 \), \( < -3 \) defined as grade 1, grade 2 and grade 3 thinness respectively based on international expert guidelines.\textsuperscript{20} PCDAI > 30 is moderate to severe paediatric CD.\textsuperscript{21,22} Clinical remission PCDAI < 10; clinical response as drop in PCDAI of 15 points from the baseline and (\( \geq 50\% \)) reduction in drainage or number of open perianal fistula. Biochemical remission as CRP < 5 mg/L and biochemical response as more than 50\% drop in CRP from baseline.\textsuperscript{23,24} Clinical relapse was defined as PCDAI > 15 on more than one occasion 1 week apart and/or CRP > 5 mg/L with clinically
active disease. Endoscopic scores were determined retrospectively by authors separately based on endoscopic images and report description using the validated Simple Endoscopic Scoring system for Crohn’s disease (SES-CD).  

2.2. Statistics

All statistical calculations were performed using Graph Pad Prism version 5.00 for Windows, Graph Pad Software, San Diego California USA. Descriptive continuous data is reported as an Inter-Quartile range. Primary clinical and biochemical response following IFX induction therapy was assessed using Paired t test. Kaplan–Meier survival analysis was used to predict cumulative risk of losing response to IFX over time. Time to event was evaluated from the date of first IFX infusion to LOR or last follow-up before transitioning to adult IBD services. Continuous variables at diagnosis and prior to IFX including time to IM from diagnosis, growth parameters, clinical and biochemical disease severity, time to IFX etc. were compared between children with sustained primary response vs. LOR at last follow-up using parametric unpaired T test. Categorical variables at diagnosis and prior to IFX were analysed by creating 2 × 2 contingency table using Fisher exact test. p value < 0.05 was used for significance. One way RM-ANOVA was used for comparing paired clinical and growth data at progressive time points.

3. Results

3.1. Demographic and phenotypic characteristics (Tables 1, 2)

65 children with confirmed CD treated with IFX therapy were identified. 18 were excluded with 13 with inadequate follow-up on maintenance IFX (<1 year), 4 on IFX for isolated complex perianal fistula and 1 due to primary non-response to IFX. 47 children with refractory luminal CD with >1 year follow-up and confirmed disease activity (43 on ileocolonoscopy, 4 on MRE/capsule with incomplete endoscopy) and primary response to IFX were included in the final analysis. At diagnosis: disease characteristics of eligible children were: median age at diagnosis 12.87 years (10.9–13.7, IQR), 33 males; ileocolonic disease in 32 (68%), strictureing 7 (15%), perianal disease 8 (17%), growth failure in 13 (28%), grades 2–3 thinness in 20 (42%) and 25/43 (59%) patients with abnormal endoscopy had moderate to severe endoscopic disease activity (SES-CD ≥ 11).

Before commencing IFX: clinical disease activity was moderate to severe, PCDAI ≥ 30 in 45/47 (96%), other 2 with complex perianal disease; growth failure was present in 12 (25%) and grades 2–3 thinness in 20 (42%) and 25/43 (59%) patients with abnormal endoscopy had moderate to severe endoscopic disease activity (SES-CD ≥ 11).

Summary of IFX responses are given in Figs. 1–4 and outcomes are discussed below.

Overall 28/47 (60%) children sustained primary response over a median duration of 2.8 years (1.6–4.4, IQR). 19/47 (40%) developed LOR (including 2 intolerant) at a median of 11 months (9–19, IQR). Of 17 with LOR, 7 were successfully re-induced giving durable response (35/47, 74%); 6/47 (13%) failed dose intensification requiring either surgery (n = 2), second anti-TNF (n = 2) or both (n = 2) and other 4/47 (8%) had surgical resection without any IFX reinduction.

The cumulative probabilities of sustained primary response to IFX were 78%, 65% and 55% after 1, 2 and 3 years on IFX maintenance therapy (Fig. 3). The cumulative probabilities of durable response to IFX were 83%, 74% and 70% after 1, 2, and 3 years on IFX maintenance therapy (Fig. 4).

3.2. Clinical outcomes of primary responders (n = 47) following IFX induction

Overall 46/47 had improved PCDAI, 36/47 (76.5%) in clinical remission, 10/47 (21.5%) had clinical response and 1 failed to respond. Of 34/47 (72%) with abnormal CRP (≥ 5) prior to IFX, 26/34 (77%) achieved biochemical remission (CRP < 5); 2/34 (6%) had biochemical response (CRP < 50% baseline).
3.3. Clinical outcomes of those with durable response (n = 40) to IFX at 1 year

At 1 year on IFX maintenance therapy, 32/47 (68%) were in clinical remission, 6/47 (13%) maintained clinical response and 2/47 (4%) had mild active disease (PCDAI < 30). Of 34/47 (72%) with abnormal CRP (>5) prior to IFX; 24/34 (70%) maintained biochemical remission; 2/34 (6%) had biochemical response (CRP < 50% of baseline) and 7/34 (23%) had no response and 1/34 increased in following IFX. Among the 40 children with durable response to IFX, 24/40 (60%) maintained both clinical and biochemical remission at 1 year.

3.4. Concomitant medications

18/47 (38%) had corticosteroid dependent disease at the time of initiation of Infliximab; this reduced to 7/47 (15%), 3/38 (8%) and 2/28 (7%) at 1, 2 and 3 years for those still receiving IFX. Concomitant IM was continued at commencement of IFX in 34/47 (72%); this remained stable at 36/47 (76%), 28/38 (74%), at 1 and 2 years and gradually reducing to 18/28 (64%) at 3 years for those still receiving IFX. Baseline disease characteristics were comparable between groups receiving concomitant IM with IFX vs. IFX alone apart from shorter interval from disease onset to IFX in those on combination vs. monotherapy (15 months vs. 27 months, p = 0.05) (Table 3).

3.5. Clinical variables at diagnosis, prior to IFX associated with LOR (Tables 4–5)

LOR (complete LOR and recovered LOR) was associated with lower BMI at diagnosis and lower height Z scores prior to IFX induction and abnormal CRP (>5 mg/L) following induction. Sustained primary response was associated with the continuation of concomitant immunomodulators beyond induction (Fig. 5).

3.6. Adverse events

2 children discontinued IFX following successful primary response due to increasing symptoms (1 developed fibrostenotic ileal disease requiring surgery, 1 recurrent fevers and lethargy post infusion). Overall 7/47 (15%) had upper respiratory tract infections; 2 influenza, 2 primary EBV, 1 HSV-1 and in 1 no virus was isolated. There were no serious infections or malignancy. 3 children had acute infusion reactions, mild severity (2 = dizziness and flushing, 1 = shortness of breath and bronchospam) and successfully continued IFX with premedications.

3.7. Longitudinal clinical and nutritional outcomes of sustained primary responders (SR) vs. LOR to IFX

Significant improvement in PCDAI, CRP, BMI and growth outcomes was observed in our entire cohort irrespective of subsequent IFX response at all measured time points including post induction, 1 year and last follow-up (Supplementary figure).

4. Discussion

This is the first Paediatric Cohort Study evaluating the detailed long term outcomes of IFX induction and maintenance therapy in children with Crohn’s disease under Australian IFX eligibility criteria. Despite the potential for confusion using current terminologies for response (sufficient clinical response to continue IFX) and remission (represented by cross-sectional numerical assessments of symptoms and CRP), we provide a clearly defined analysis of clinically important outcomes in a well characterised cohort of children with homogenous approach.
We demonstrate the cumulative probability of sustained primary response to IFX maintenance as 78%, 65% and 55% at 1, 2 and 3 years. In particular, we detail the key predictors of response to IFX in children. BMI Z-scores > −2 at diagnosis, better height Z score recovery on therapies before use of IFX, normal CRP after IFX induction and continuation of IMs with...

**Figure 1** Outcome and reasons for failure of IFX at last follow-up.

**Figure 2** Annual follow-up of IFX following primary response in study cohort.
IFX maintenance predict a sustained primary response to IFX. We employed robust definitions to determine LOR to IFX, the majority 17/19 (89%) had endoscopic or MR Enterography confirmed relapse before alternative interventions were employed. We subdivide LOR to clarify important clinical endpoints namely, those who commence Infliximab and never lose response (sustained primary response), those with LOR and regain response with dose intensification (recovered response) and those who show complete LOR (discontinuation due to intolerance, failure to regain response after dose intensification and requiring a second anti-TNF agent or surgical excision).

Using these definitions, the cumulative probability of durable response (sustained primary and recovered) to IFX was observed in 83%, 74% and 70% at 1, 2, and 3 years. These outcomes compare favourably with paediatric studies reporting long term cumulative LOR probability up to 40–55% at 3 years14,15 and comparable to the large North American multicentre cohort study from Hyams16 where 67% were likely to continue IFX at 3 years. Improved outcomes in our cohort could be related to early use of IFX (median disease duration 0.97 years, IQR, 0.41–1.94), use of concomitant immunomodulators (over 70%) during IFX maintenance therapy similar to Hyams study.16 In children with LOR, dose intensification was given in 13/47 (28%) at a median of 11.25 months, successfully restoring response in 7/13 (54%). Requirement of IFX dose intensification is comparable to more recent EPIMAD cohort study but lower than 49–57%, reported in previous studies.14–16 Of 40% (19/47) who developed LOR or intolerance, the majority (75%) did so within 2 years of commencing therapy. This is a consistent observation across all major trials of anti-TNF agents in CD, reporting 23–46% LOR within 12 months and slower loss thereafter.13

Clinical remission (PCDAI < 10) in those with durable response to IFX was seen in 32/47 (68%) at 1 year which is comparable to the large prospective open label paediatric study reporting clinical remission in 55% at week 54 on scheduled IFX without the need for dose intensification.26 In addition, we also observed 24/40 (60%) children with durable response on scheduled IFX therapy at 1 year and maintained both clinical and biochemical remission at 1 year. This is new finding and a more composite measure of success in maintaining remission on scheduled IFX therapy in our homogenous managed cohort.

LOR in our cohort was associated with abnormal CRP (N 5 mg/L) following IFX induction, similar to reports from large adult studies indicating raised CRP correlates with mucosal disease activity and increased likelihood of relapse.27,28 We also found increased LOR in children with grades 2–3 thinness at diagnosis and in those with poor height Z scores prior to commencing IFX. Poor BMI and growth failure are likely surrogate markers of increased disease severity and increase likelihood of LOR to IFX.29,30 These findings are novel despite limitations of type 1 error due to small sample size and nominally significant p value. Other variables including duration of disease, time to IFX, disease severity, ileal or small bowel location or complicating phenotypes and steroid dependency were not found to be significantly associated with LOR.

Improved sustained primary response was associated with continuation of IM beyond IFX induction (combination therapy), despite the potential bias toward choosing more aggressive approach in those with more severe disease. However, baseline demographics including clinical, biochemical and endoscopic were similar in those on combination therapy vs. monotherapy. A shorter disease duration was noted in those on combination therapy (15 vs. 27 months,

Table 3  Baseline characteristics of those on combination (IM + IFX) vs. monotherapy (IFX).

<table>
<thead>
<tr>
<th>Disease activity</th>
<th>Combination</th>
<th>Monotherapy</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean PCDAI</td>
<td>33.23</td>
<td>37.69</td>
<td>NS</td>
</tr>
<tr>
<td>Mean CRP</td>
<td>33.52</td>
<td>34.76</td>
<td>NS</td>
</tr>
<tr>
<td>Mean BMI Z score</td>
<td>−1.68</td>
<td>−1.06</td>
<td>NS</td>
</tr>
<tr>
<td>Mean height Z score</td>
<td>−0.40</td>
<td>−0.67</td>
<td>NS</td>
</tr>
<tr>
<td>Mean SES (n = 43)</td>
<td>13.5</td>
<td>11.3</td>
<td>NS</td>
</tr>
<tr>
<td>Mean disease duration</td>
<td>15.34</td>
<td>27.21</td>
<td>.05</td>
</tr>
<tr>
<td>before IFX (months)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sex (males)</td>
<td>24</td>
<td>9</td>
<td>NS</td>
</tr>
<tr>
<td>Ileocolonic disease</td>
<td>25</td>
<td>7</td>
<td>NS</td>
</tr>
<tr>
<td>Strictures/fistulising</td>
<td>4</td>
<td>3</td>
<td>NS</td>
</tr>
<tr>
<td>disease</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Steroid dependent disease</td>
<td>13</td>
<td>5</td>
<td>NS</td>
</tr>
</tbody>
</table>

Figure 3  Survival curves of primary IFX response.

Figure 4  Durability of IFX response over time.
p = 0.05) vs. IFX monotherapy. We feel that this was probably related to change in our clinical practice over time with earlier introduction of IFX and continuation of combination therapy. Although not statistically significant, such factors underscore the complexity of interpreting the impact of combination therapy on sustained remission in a retrospective study.

Data supporting the benefits of combination therapy beyond 6 months IFX remains inconclusive. Higher CRP and lower IFX trough levels were found in those discontinuing AZA after the first 6 months suggesting that longer follow-up and adequately powered trials are required to confirm the clinical benefits of combination therapy.  

We have characterised the outcomes of an Australian paediatric Crohn’s patients failing standard induction therapies of EEN or steroids and 3 months immunomodulators on IFX. Detailed longitudinal outcomes from diagnosis (as described in the Supplementary figure) are excellent with the majority of children achieving normalisation of growth parameters, clinical and biochemical measures of disease. Even patients with LOR respond either to dose intensification, to change of anti-TNF agent or to surgery.

In conclusion, using robust criteria and a homogenous treatment approach we confirm excellent durable responses (sustained primary plus recovered) on IFX maintenance therapy in a single centre retrospective cohort study. We also demonstrate poor BMI, growth failure, poor CRP response to IFX induction and failure to use concomitant IM to be associated with increased loss of response to IFX maintenance therapy.

Supplementary data to this article can be found online at http://dx.doi.org/10.1016/j.crohns.2013.12.017.

**Conflict of interest statement**

Zubin Grover received PHD scholarship from ANZ Public trustees and is currently on paediatric advisory board for Abbivee Pharmaceuticals. Peter Lewindon has received honoraria from Janseen Cilag and Abbivee for delivering lectures and attending advisory board meetings and is currently on Advisory board panel for both Janseen Cilag and Abbivee pharmaceuticals. Nicholas Carman and Rebecca Biron have no financial disclosures.

### Table 4  Baseline characteristics of group with sustained response (SR) vs. loss of response (LOR) to IFX.

<table>
<thead>
<tr>
<th>Clinical characteristics at diagnosis</th>
<th>SR (28)</th>
<th>LR (19)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex males</td>
<td>19</td>
<td>14</td>
<td>NS</td>
</tr>
<tr>
<td>PCDAI &gt; 30 (mod-severe CD)</td>
<td>24</td>
<td>12</td>
<td>NS</td>
</tr>
<tr>
<td>BMI Z score &lt; −2</td>
<td>9</td>
<td>12</td>
<td>.04</td>
</tr>
<tr>
<td>Height Z score &lt; 1.64 (growth failure)</td>
<td>5</td>
<td>8</td>
<td>NS</td>
</tr>
<tr>
<td>Baseline CRP &lt; 5 mg/L</td>
<td>3</td>
<td>6</td>
<td>NS</td>
</tr>
<tr>
<td>SES &gt; 11 (mod-severe endoscopic disease)</td>
<td>14</td>
<td>11</td>
<td>NS</td>
</tr>
<tr>
<td>Isolated ileal disease</td>
<td>4</td>
<td>3</td>
<td>NS</td>
</tr>
<tr>
<td>Upper GI disease</td>
<td>19</td>
<td>10</td>
<td>NS</td>
</tr>
<tr>
<td>Restricting</td>
<td>4</td>
<td>3</td>
<td>NS</td>
</tr>
<tr>
<td>Perianal</td>
<td>6</td>
<td>6</td>
<td>NS</td>
</tr>
<tr>
<td>EEN only induction</td>
<td>13</td>
<td>5</td>
<td>NS</td>
</tr>
<tr>
<td>Steroids only induction</td>
<td>8</td>
<td>8</td>
<td>NS</td>
</tr>
<tr>
<td>Early IM (&lt;3 months from diagnosis)</td>
<td>20</td>
<td>17</td>
<td>NS</td>
</tr>
<tr>
<td>Mean duration of symptoms (months)</td>
<td>7.05</td>
<td>8.67</td>
<td>NS</td>
</tr>
<tr>
<td>Mean PCDAI (SD)</td>
<td>33.43 (9.3)</td>
<td>35.25 (12.2)</td>
<td>NS</td>
</tr>
<tr>
<td>Mean CRP (SD)</td>
<td>34.7 (33)</td>
<td>33.30 (30)</td>
<td>NS</td>
</tr>
<tr>
<td>Mean SES-CD</td>
<td>12.13 (n = 26)</td>
<td>12.48 (n = 17)</td>
<td>NS</td>
</tr>
<tr>
<td>Mean BMI Z scores (SD)</td>
<td>−1.19 (1.7)</td>
<td>−1.93 (2.6)</td>
<td>NS</td>
</tr>
<tr>
<td>Mean height Z scores (SD)</td>
<td>−0.83 (1.2)</td>
<td>−1.03 (1.3)</td>
<td>NS</td>
</tr>
<tr>
<td>Mean time to IM from diagnosis (months)</td>
<td>2.6</td>
<td>2.14</td>
<td>NS</td>
</tr>
</tbody>
</table>

### Table 5  Clinical variables prior to and during IFX therapy associated with LOR to IFX.

<table>
<thead>
<tr>
<th>Clinical characteristics</th>
<th>SR (28)</th>
<th>LR (19)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean PCDAI before IFX(SD)</td>
<td>32.4 (10.5)</td>
<td>34.7 (10.8)</td>
<td>NS</td>
</tr>
<tr>
<td>Mean CRP before IFX(SD)</td>
<td>18.8 (35)</td>
<td>8.75 (10)</td>
<td>NS</td>
</tr>
<tr>
<td>Mean time to IFX in months (SD)</td>
<td>20 (19.3)</td>
<td>17.23 (20.3)</td>
<td>NS</td>
</tr>
<tr>
<td>Mean FU on IFX in months (SD)</td>
<td>34.7 (17.6)</td>
<td>46 (20.9)</td>
<td>NS</td>
</tr>
<tr>
<td>Mean BMI Z score (SD)</td>
<td>−0.53 (1.2)</td>
<td>−0.77 (5.3)</td>
<td>NS</td>
</tr>
<tr>
<td>Mean height Z score (SD)</td>
<td>−0.53 (1.3)</td>
<td>−1.48 (1.4)</td>
<td>.04</td>
</tr>
<tr>
<td>CRP (&gt;5 mg/L) after IFX induction</td>
<td>3</td>
<td>9</td>
<td>.007</td>
</tr>
<tr>
<td>Continued IM's with IFX induction</td>
<td>24</td>
<td>10</td>
<td>.02</td>
</tr>
</tbody>
</table>
Cumulative risk of LOR between IFX alone or IFX and IM

Figure 5  Cumulative risk of LOR between IFX + IM vs. IFX.

References


