Improvement in Quality of Life of Rheumatoid Arthritis Patients on Biologic Therapy

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Cost of Biologic Therapy

• Total world market for anti-TNF inhibitors in RA in 2007 was approx. €7 billion

• While 90% of patients are treated with conventional disease modifying antirheumatic drugs (DMARDs), 90% of the cost is attributed to biologics

• In Ireland the spend on RA has increased dramatically in the last 5 years and this is mainly related to drug therapy and specifically the newer biologic disease modifying agents
Biologic Drugs

• There are currently six main biologic drugs licensed for RA in Ireland:
  – Adalimumab (Humira®, etanercept (Enbrel®), infliximab (Remicade®), anakinra (Kineret®), rituximab (Mabthera®) and abatacept (Orencia®)

• Self Injectable (i.e. Humira®, Enbrel® and Kineret®) are currently reimbursed under the high technology drugs scheme in Ireland

• Remicade®, Mabthera® and Orencia® can only be prescribed in hospital
Biologic Drugs

• Three main modes of action:
  – Anti-Tumour Necrosis Factor (TNF) (Humira®, Enbrel®, Remicade®)
  – B cell target (Mabthera®)
  – T cell targeted (Orencia®)

• Consistently been shown to reduce disease activity to a greater extent in RA patients than conventional DMARDs

• The focus of this project is on the anti-TNF currently approved in RA
Irish Spend on Biologics

Millions

€0 €10 €20 €30 €40 €50 €60

€11m 2004 8%

€20m 2005 12%

€39m 2006 23%

€51m 2007 26%
Rheumatoid Arthritis

Recent Onset Disease

Moderately Advanced

Severely Advanced
Disease Activity Measurement

- DAS 28 – based on joint score (28), laboratory measure of inflammation (ESR or CRP) and global health measurement as measured by patient
- High Disease Activity - > 5.1
- Moderate - > 3.2 and ≤5.1
- Good - ≤3.2
- Remission - <2.6
• Does a Good DAS 28 = Good QoL?

• Quality-of-life (QoL) assessments are particularly important in the absence of a cure for RA.
Patient Reported Outcomes (PROs)

• PRO’s are increasingly used as outcome measures in RCTs
• OMERACT have recognised PROs as important measures in determining improvement
• May be more sensitive to change than disease activity scores
Generic vs. Disease Specific HRQoL Measures

- Generic - SF-36, EQ-5D, HUI
- Disease specific e.g. RA (RAQoL), musculoskeletal disease (HAQ)
- Generic measures allow for outcome comparison but may not be as sensitive to change as disease specific measures
SF-36® Measurement Model

<table>
<thead>
<tr>
<th>Items</th>
<th>Scales</th>
<th>Summary Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>3a. Vigorous Activities</td>
<td>Physical Functioning (PF)</td>
<td></td>
</tr>
<tr>
<td>3b. Moderate Activities</td>
<td></td>
<td></td>
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<tr>
<td>3c. Lift, Carry Groceries</td>
<td></td>
<td></td>
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<tr>
<td>3d. Climb Several Flights</td>
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<td></td>
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<tr>
<td>3e. Climb One Flight</td>
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<td></td>
</tr>
<tr>
<td>3f. Bend, Kneel</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3g. Walk Mile</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3h. Walk Several Blocks</td>
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<td></td>
</tr>
<tr>
<td>3i. Walk One Block</td>
<td></td>
<td></td>
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<tr>
<td>3j. Bathe, Dress</td>
<td></td>
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</tr>
<tr>
<td>4a. Cut Down Time</td>
<td>Role-Physical (RP)</td>
<td></td>
</tr>
<tr>
<td>4b. Accomplished Less</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4c. Limited in Kind</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4d. Had Difficulty</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Pain-Magnitude</td>
<td>Bodily Pain (BP)</td>
<td></td>
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<tr>
<td>8. Pain-Interference</td>
<td></td>
<td></td>
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<tr>
<td>1. EVGFP Rating</td>
<td>General Health (GH)*</td>
<td></td>
</tr>
<tr>
<td>11a. Sick Easier</td>
<td></td>
<td></td>
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<tr>
<td>11b. As Healthy</td>
<td></td>
<td></td>
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<tr>
<td>11c. Health To Get Worse</td>
<td></td>
<td></td>
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<tr>
<td>11d. Health Excellent</td>
<td></td>
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<tr>
<td>9a. Pep/Life</td>
<td>Vitality (VT)*</td>
<td></td>
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<tr>
<td>9e. Energy</td>
<td></td>
<td></td>
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<tr>
<td>9g. Worn Out</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9i. Tired</td>
<td></td>
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</tr>
<tr>
<td>6. Social-Extent</td>
<td>Social Functioning (SF)*</td>
<td></td>
</tr>
<tr>
<td>10. Social-Time</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5a. Cut Down Time</td>
<td>Role-Emotional (RE)</td>
<td></td>
</tr>
<tr>
<td>5b. Accomplished Less</td>
<td></td>
<td></td>
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<tr>
<td>5c. Not Careful</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9b. Nervous</td>
<td>Mental Health</td>
<td></td>
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<tr>
<td>9c. Down in Dumps</td>
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<td></td>
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<tr>
<td>9d. Peaceful</td>
<td></td>
<td></td>
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<tr>
<td>9f. Blue/Sad</td>
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<td></td>
</tr>
<tr>
<td>9h. Happy</td>
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</tbody>
</table>

* Significant correlation with other summary measure.

Methodology

- Prospective review of patients on biologic agents attending a rheumatology biologic clinic
- All patients entered onto a database between 2004 and 2007 with rheumatoid arthritis included (N=241)
- Completed SF-36 (version 1) at baseline and 1 year post initiation of biologic therapy (self-administered)
- DAS 28 was also completed at these time points
### Demographics (N=241)

<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
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</thead>
<tbody>
<tr>
<td>Mean Age</td>
<td>56 years (17-85yrs)</td>
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<tr>
<td>Female (%)</td>
<td>70%</td>
</tr>
<tr>
<td>Mean RA Duration</td>
<td>14 years (1-42yrs)</td>
</tr>
<tr>
<td>Mean DAS 28 (Baseline)</td>
<td>5.6 (SD 1.1)</td>
</tr>
<tr>
<td>Mean DAS 28 (12mths)</td>
<td>2.8 (SD 1.1)</td>
</tr>
</tbody>
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DMARD History

- 94% of patients had previously been on a DMARD
- 82% had previously been on methotrexate
- At baseline 72% were on DMARD - 84% were on methotrexate
- At 12 months 81% were on DMARDs concurrently with biologic
Mean Tender and Swollen Joint Scores Pre and Post Biologic Therapy (N=89)

- Tender Joint Score
- Swollen Joint Score

Number of Joints

Baseline
12 Months

*p<0.001
Mean Physical and Mental Component Scores Pre and Post Biologic Therapy

* indicates p<0.05
Change in Scales associated with Physical Component Score

SF-36 Score (0-100)

- Physical Function
- Role Limitation (physical)
- Body Pain
- General Health

Baseline 12 month Adult Norm(UK)

*p=0.01
**p<0.005
Change in Scales associated with Mental Component Score

SF-36 Score (0-100)

- Vitality*
- Social Function*
- Role Limitation (Emotional)*
- Mental Health†

Baseline
12 month
Adult Norm (UK)

*p<0.01
†p=0.06
Relationship between HRQoL and Disease Activity Score

• There was a significant negative correlation identified between the change in DAS 28 scores and the change in PCS ($r = -0.445$, $p<0.001$).

• A significant correlation was not seen with DAS 28 and MCS ($r = -0.114$, $p=0.366$)
Summary

• There is a dramatic increase in QoL of patients with RA following 1 year of biologic therapy

• QoL as demonstrated by PRO approaches UK norms post biologic therapy

• These results are consistent with other studies examining the effect of biologic therapy on QoL (Han C et al., 2007)
Future Aims

• Continue to collect data on this patient cohort alongside cost data
• Use the SF-6D to convert these SF-36 scores into utilities
• To examine the relationship between the DAS28 and these utilities
Thank You

• Patients in the rheumatology Unit
• The specialist nurses in the unit Miriam Molloy, Alexia Grier and Catherine Slattery
• My colleagues in the NCPE, Dublin