

DOSE PATTERN ANALYSIS FOR BIOLOGICS IN THE TREATMENT OF PSORIASIS IN CANADA : INFORMATION RETRIEVED FROM ADMINISTRATIVE CLAIMS DATABASES

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SUMMARY

Background

- High cost biologic treatments for diseases such as plaque psoriasis, raise growing concerns over the increasing cost to the health care systems that are funding these treatments. Administrative databases can generate important information about the way these drugs are prescribed in a "real world" setting.
- In the current biologic market in Canada, products are recommended for multiple indications making it difficult to understand the dosing patterns for a specific indication. IMS Health Brogan has developed an algorithm to categorize indication-specific claims based on prescriber specialty and concomitant medication use. This algorithm can be applied to a variety of products offered by IMS Health Brogan, such as RxDynamics® or the IMS Longitudinal Claims Dataset.

Objectives

- The objectives of this analysis were to determine the initial dosing and identify dose escalation patterns for biologics in the treatment of psoriasis in Canada.

Methods

- A sample of data from patients covered by the public (Quebec and Ontario) and private drug plans in Canada, who received a biologic between January 2010 and August 2012 for at least 12 months, were retrieved (IMS Health Brogan, IMS Longitudinal Claims Dataset, Jan 2010 - Aug 2013, reported Nov 2013). A specific algorithm was developed based on prescriber information and concomitant medications to capture claims associated to psoriasis. Dosing analysis was performed for four biologics approved for psoriasis in Canada: adalimumab, etanercept, infliximab and ustekinumab. Dose escalation was defined as a 20% dose increase above the previous dose, excluding induction.

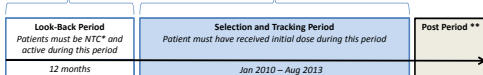
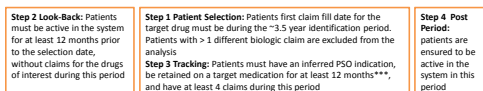
OBJECTIVE

- Determine the initial dosing and identify dose escalation patterns for biologics in the treatment of psoriasis in Canada.

METHODS

Eligible patient identification

- A 4-step approach was applied to identify eligible patient cohorts for this study



*NTC - New biologic
** Patients must be tracked for an additional 3-month period after the last claim to ensure data integrity
*** Retention calculations only include patients that were tracked for a sufficiently long period of time (i.e. to be included in one year retention calculation, a patient's initial dispensing date must allow for at least 1 year of tracking)

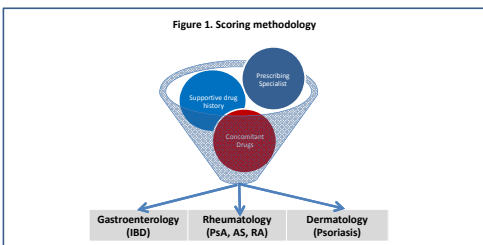


Table 1. Raw longitudinal claims dataset

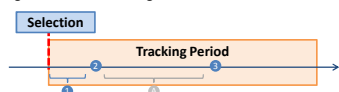
Number of patients	14,454
Number of claims	210,305

Table 2. Patient selection

Screening criteria	Action	Number of Patients Removed	Patient Impact (%)	Number of Claims Removed	Claim Impact (%)
Age	Remove patients under 18 years old	78	0.54%	1,048	0.50%
Multiple Biologics	Remove patients who eventually switched to another biologic therapy	2,054	14.21%	25,353	12.06%
Zero Cost	Remove patients with total cost of therapy (sum of all claims) less than \$200	56	0.39%	158	0.08%
Number of Claims	Remove patients with less than 4 claims	1,742	12.05%	3,559	1.69%
Therapy Duration	Remove patients with less than 3 months of therapy	11	0.08%	47	0.02%
Non-target Product	Remove patients not on Enbrel®, Humira®, Stelara® or Remicade®	518	3.58%	4,868	2.31%
Experienced patients	Remove experienced patients	3,924	27.15%	94,087	44.74%
Final longitudinal claim data		6,071	42.00%	81,185	38.60%

Treatment phases identification

- Extracting metrics from the longitudinal claims dataset



The following metrics were extracted from the longitudinal claims dataset:

- Loading Phase:** The loading phase defined on a product basis
 - Etanercept: All claims with dispensing date in the first 12 weeks of therapy
 - Adalimumab: All claims with dispensing date in the first 4 weeks of therapy
 - Infliximab: All claims with dispensing date in the first 8 weeks of therapy
 - Ustekinumab: All claims with dispensing date in the first 5 weeks of therapy
- Maintenance Phase:** Period between loading phase and escalation
- Escalation Phase:** Escalation was defined as a 20% dose increase above the previous weekly dose (not including the loading phase). Every claim post escalation was considered as escalation phase
- Time until dose escalation:** Post loading phase, time to escalation is calculated taking the number of weeks in maintenance until a dose increase >20%

- Calculation of:

Average dose: weekly, by phase, and retention pattern
Total dose: by phase, and on a yearly basis
Cost: total cost by retention pattern

CONCLUSION

Across all treatments, dose escalation was recorded in over 60% of patients, most often in the first year of treatment, indicating that patients may require additional doses to maintain response. These findings highlight the need to conduct additional research to determine if there is a need for new treatments which provide high sustained efficacy, with a rapid onset of action.

RESULTS

Patient population

- A total of 6,071 patients were identified and met the selection criteria (table 3). Of these, 4,510 patients received at least 12 months of therapy.
- The majority of the population were male (59%) (table 4).

Table 3. Patient distribution by payer

Payer	BC	Prairies	ON	QC	Atlantic	Other	National	%
PDP	350	584	2,046	943	757	112	4,792	79%
ODB	0	0	885	0	0	0	885	15%
RAMQ	0	0	0	394	0	0	394	6%
Total	350	584	2,931	1,337	757	112	6,071	100%
%	6%	10%	48%	22%	12%	2%	100%	

Table 4. Gender distribution

Payer	Male	Female	Unknown
PDP	60%	39%	0%
ODB	55%	44%	1%*
RAMQ	55%	45%	0%
Total	59%	40%	0%

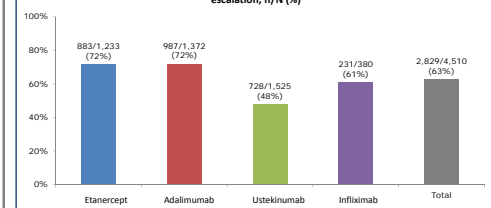
Dose Escalation

- The average first year dose was higher than years 2 and 3, consistent with the induction period for each drug. Overall, 63% of patients experienced a dose escalation, of which 68% occurred within the first year, excluding induction (Table 5, Figure 2). The peak frequency of dose escalation occurred between weeks 11-30.

Table 5. Number of weeks until dose escalation

Product	Initiated Patients	Escalated Patients	Escalated Patients (%)	Avg. Weeks Before Escalation	Max. Weeks Before Escalation
Etanercept	1,233	883	72%	40	163
Adalimumab	1,372	987	72%	35	185
Ustekinumab	1,525	728	48%	54	189
Infliximab	380	231	61%	55	177
Total	4,510	2,829	63%	43	189

Figure 2. Patients with at least 12 months of therapy who experienced dose escalation, n/N (%)



- The difference between the maintenance and escalated doses were calculated based on weighted average daily doses per patient and per payer. The calculated daily, escalated dose was greater than maintenance by approximately 9% for adalimumab, 14% for etanercept, and 28% for ustekinumab (Tables 6-8).

Table 6. Average daily escalated dose vs maintenance dose of etanercept and weighted average difference by payer

Payer	Patient count (n)	Average daily maintenance dose (mg)	Average daily escalated dose (mg)	Difference escalated vs maintenance dose (mg (%))
RAMQ	90	8.38	9.65	1.27 (15.16)
ODB	308	8.39	9.65	1.26 (15.02)
PDP	1,296	8.36	9.47	1.11 (13.28)
TOTAL	1,694	8.36	9.51	1.15 (13.76)

Table 7. Average daily escalated dose vs maintenance dose of adalimumab and weighted average difference by payer

Payer	Patient count (n)	Average daily maintenance dose (mg)	Average daily escalated dose (mg)	Difference escalated vs maintenance dose (mg (%))
RAMQ	159	3.08	3.26	0.18 (5.84)
ODB	276	3.01	3.29	0.28 (9.30)
PDP	1,604	3.01	3.28	0.27 (8.97)
TOTAL	2,039	3.02	3.28	0.26 (8.61)

Table 8. Average daily escalated dose vs maintenance dose of ustekinumab and weighted average difference by payer

Payer	Patient count (n)	Average daily maintenance dose (mg)	Average daily escalated dose (mg)	Difference escalated vs maintenance dose (mg (%))
RAMQ	122	0.64	0.76	0.12 (18.75)
ODB	272	0.60	0.70	0.10 (16.67)
PDP	1,707	0.60	0.79	0.19 (31.66)
TOTAL	2,101	0.60	0.77	0.17 (28.33)