# 17 Year Experience of Treating Multiple Sclerosis (MS) with Intramuscular Beta Interferon (INF)-1a Twice a Week (BIW) **Robert Baumhefner, MD, VA West Los Angeles Healthcare Center**

#### ABSTRACT

Title: 17 Year Experience of Treating Multiple Sclerosis (MS) with Intramuscular Beta Interferon (INF)-1a Twice a Week (BIW)

Objective: A retrospective observational, study of MS patients with breakthrough disease on intramuscular (IM) beta INF-1a once per week switched to IM beta INF-1a BIW

Background: In some previous clinical trials (PRISMS, EVIDENCE, INCOMIN, Khan et al. Trojano et al.) there has been a suggestion of a dose response effect for beta INF in MS. However, the European Interferon beta-1a Dose Comparison Study found no change in efficacy with just doubling the standard dose of IM beta INF-1a once per week. This may not be the same as increasing the frequency of IM INF administration. Also, none of these previous studies have information on patients with breakthrough disease on standard dose IM beta INF-1a switched to BIW dosing.

Design/methods: 107 MS patients were started on IM beta INF-1a at the MS clinic of the Veterans Administration West Los Angeles Medical Center from 1995 to 2015. Of these 59 patients with breakthrough disease were switched to BIW IM beta INF-1a. There was adequate follow-up for at least two years on 52 of these patients. Patients were followed an average of every 4 months. At each visit an interval history of any relapse, Incapacity Status Scale, Functional Systems Scale, Expanded Disability Status Scale (EDSS), and a proprietary graded neurological examination was obtained. Annual MRI of the brain using a contrast enhanced MS protocol was obtained on most patients. Breakthrough disease was defined as continued clinical relapses, new T2 or enhanced lesions on MRI, or worsening of EDSS or the neurological exam.

Results: Of the 52 patients with adequate follow-up, 26 had no further breakthrough disease for 14 months or more (range 14-192 months). 5 patients did not tolerate the increase in frequency of administration. Beta INF neutralizing antibody testing was performed on 25 patients while on BIW dosing and one patient who failed BIW beta INF had consistently elevated titers on 2 determinations (4%). African American patients, patients with a higher EDSS score when switching, and patients with a longer duration of stability on QW treatment may be less likely to respond.

Conclusions: For MS patients having breakthrough disease on standard dose IM beta IFN-1a, switching to a more frequently administered beta IFN may be an option. Advantages to using an IM beta IFN preparation for this include no skin reactions and a lower incidence of IFN neutralizing antibodies. A prospective, blinded, randomized trial comparing once and twice per week IM beta INF-1a may be indicated.

### **OBJECTIVES**

This is a retrospective, observational study of the effectiveness of switching MS patients with breakthrough disease on intramuscular (IM) beta INF-1a once per week to twice a week treatment.

## CONCLUSIONS

For MS patients having breakthrough disease on standard dose IM beta IFN-1a, switching to a more frequently administered beta IFN may be an option. Advantages to using an IM beta IFN preparation for this include no skin reactions and a lower incidence of IFN neutralizing antibodies.

However African American patients, patients with a higher EDSS score when switching, and patients with a longer duration of stability on QW treatment may be less likely to respond..

107 MS patients were started on IM beta INF-1a at the MS clinic of the Veterans Administration West Los Angeles Medical Center from 1995 to 2015. Of these 58 patients with breakthrough disease were switched to BIW IM beta INF-1a. There was adequate follow-up for at least two years on 50 of these patients. Patients were followed an average of every 4 months. At each visit an interval history of any relapse, Incapacity Status Scale, Functional Systems Scale, Expanded Disability Status Scale (EDSS), and a proprietary graded neurological examination was obtained. Annual MRI of the brain using a contrast enhanced MS protocol was obtained on most patients. Breakthrough disease was defined as continued clinical relapses, new T2 or enhanced lesions on MRI, or worsening of EDSS or the neurological exam.

Statistical Analysis: Student's t-test was used to analyze continuous variables between patients who were stable on BIW IFN and those who were not. Chi-square test was used for categorical variables and Fisher's exact test for categorical variables with small cell sizes. The research described was supported by NIH/National Center for Advancing Translational Science (NCATS) UCLA CTSI Grant Number UL1TR001881.

Age Range Duration of Disease Sex

Race/Ethnicity

MS Phase

months)

21 patients were not stable on BIW Beta INF-1a

A prospective, blinded, randomized trial comparing once and twice per week IM beta INF-1a may be indicated.



#### METHODS

**Patient Characteristics** 30-86 years 2.5 months to 54 years 21 females 86 males

74 Caucasian. 27 African American, 4 Hispanic, 1 Asian

31 Relapsing-remitting, 60 Secondary progressive,

16 Primary progressive

### **RESULTS**

107 MS patients were started on IM beta INF-1a from 1995 to 2015.

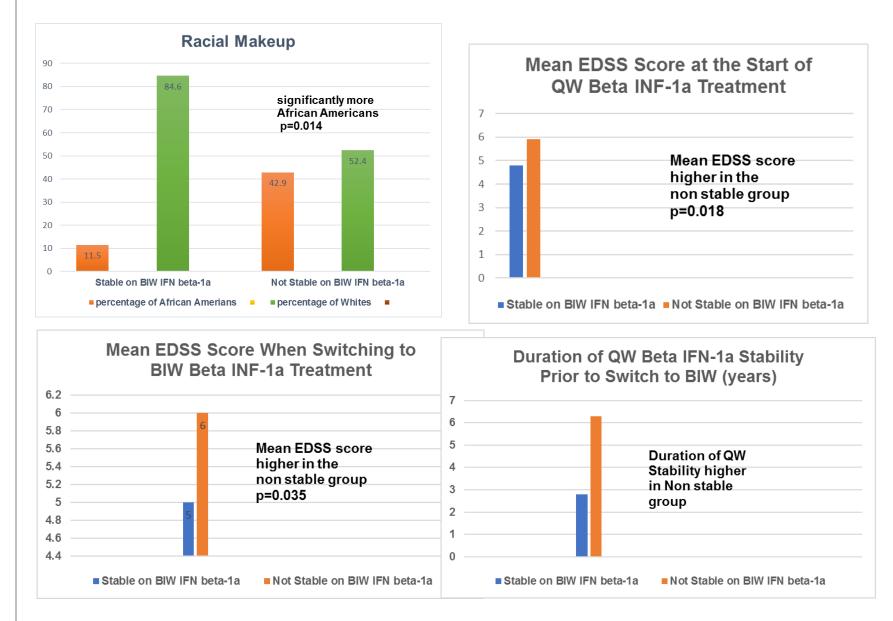
59 patients with breakthrough disease were switched to BIW IM beta INF-1a.

52 of these patients had adequate follow-up for at least 2 years

5 patients did not tolerate BIW IM beta INF-1a

26 had no further breakthrough disease for 14 months or more (range 14-192

Age at time of treatment	NS
Age at onset of MS	NS
Sex	NS
Duration of disease	NS
Relapse as reason for	
Switch to BIW	NS



## REFERENCES

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#### Neutralizing antibody testing was performed on 25 patients while on BIW dosing and one patient who failed BIW beta INF had consistently elevated titers on 2 determinations (4%).

#### Analysis of Patient Characteristics Distinguishing Success or Failure with BIW Beta INF-1a Treatment

New MRI activity as reason	
for switch to BIW	NS
Stability on QW prior	
to switch to BIW	NS
Type of MS disease	NS

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