



Letter

A retrospective review of veterans' adherence to allergen immunotherapy during 10 years

There are many factors that affect adherence rates to allergen immunotherapy (AIT) in the literature, with adherence rates varying from 13% to 89%.¹ On the basis of our literature review, no studies have evaluated factors that affect adherence to AIT in the veteran population. We decided to evaluate veterans' AIT adherence at the largest US Department of Veterans Affairs (VA) immunotherapy clinic on the West Coast located in the West Los Angeles Veterans Affairs (WLA VA) Medical Center and identify epidemiologic factors that affect AIT adherence.

A retrospective medical record review was performed on patients who received AIT at the WLA VA Medical Center within the last 10 years. Adherence was defined as individuals who had received their first injection of AIT and who had received more than 50% of the recommended number of injections at 5 set intervals after initiation of AIT: 0 to 3 months, 3 to 6 months, 6 to 12 months, 12 to 24 months, and 24 to 36 months. Patients who had completed the entire 5-year course or who had their AIT stopped by an allergist were also defined as adherent. These parameters are similar to a previous study that evaluated AIT adherence in a military hospital.² Patients who were nonadherent were defined as patients who had received at least one injection and had stopped AIT without approval of their allergist or patients who received more than 50% of the recommended AIT dose. Patients were grouped by age, comorbid posttraumatic stress disorder (PTSD) and/or general psychiatric diagnosis, socioeconomic status, and distance to clinic. We excluded patients from the study who were scheduled to begin AIT but never received their first dose. The results were tabulated using χ^2 analysis. The *P* value was then obtained via the χ^2 distribution. *P* < .05 was regarded as statistically significant, lending that the observation is a significant deviation from our null hypothesis.

Of the 174 medical records reviewed, 18 were excluded. Reasons for exclusion included never receiving the first shot of immunotherapy and completing AIT therapy before March. Of all the factors evaluated, only age had statistical significance (*P* = .02); adherence was noted to increase with age (Fig 1). Age was divided into the following age brackets: 18 to 35 years, 36 to 65 years, and 66 years or older; adherence rates were 46.7% (*n* = 15), 58.3% (*n* = 96), and 78.7% (*n* = 47), respectively. Because we do not see veteran children, our patient population on average is older compared with other non-VA facilities that provide AIT; the mean age of patients receiving AIT at our clinic is 53.5 years. Thus, many of our veterans have multiple chronic comorbid diagnoses. Again, interestingly, our overall adherence rate of 63.5% (*n* = 99) is similar to non-VA facilities that see a younger patient population.^{1–3} In fact, we observed a statistically significant increase in adherence with age. This finding is likely because veterans older than 66 years are

usually retired and do not have other time commitments, such as employment, dependents, or school.

Another unique epidemiologic factor that affects veterans is psychiatric illness. For example, PTSD is a common diagnosis in the veteran population, affecting 30.8% of the patients evaluated in this review. PTSD has been reported by multiple studies to affect disease outcomes and adherence to treatment plans.^{4,5} Patients with a diagnosis of PTSD were grouped and their adherence to AIT was evaluated compared with patients without a diagnosis of PTSD. Likewise, patients with any psychiatric diagnoses (including PTSD) were grouped, and their adherence was compared with patients without a psychiatric diagnosis. Interestingly, our review found a trend to better adherence to AIT therapy in patients with the diagnosis of PTSD and/or general psychiatric disorder, with adherence rates of 66.7% (*n* = 48) vs 61.8% (*n* = 110) (*P* = .50) and 66.3% (*n* = 83) vs 60.8% (*n* = 0.74) (*P* = .48), respectively. One possibility is that mental health professionals at the VA more regularly follow up these patients; thus, these patients are accustomed to regular physician visits. Another possibility is that the diagnosis of PTSD qualifies patients for disability, and these veterans are legally disabled and do not have employment commitments. A larger veteran study is needed to evaluate these interesting trends.

Socioeconomic status has previously been found in studies to affect adherence to treatment.⁶ A recent review found this to be an indication of a decreased adherence to AIT after the economic recession in Spain,³ but this was not supported by our review. Socioeconomic status was stratified into low, middle, or high socioeconomic groups, with low defined as a patient having a mean household annual income between \$0 and \$50,000, medium defined as a household income of \$50,001 to \$100,000, and high as a household income of more than \$100,001. This information was gathered based on the patients' zip codes using the US Census Bureau FactFinder website. Adherence rates for low, medium, and high socioeconomic groups were 64% (*n* = 56), 63% (*n* = 80), and 66% (*n* = 12), respectively, although these findings were not statistically significant (*P* = .90). Our patients at the WLA VA Medical Center are unique in that they do not pay fees for immunotherapy injections or treatment by an allergist. Interestingly, our adherence rates are similar to studies in which patients pay for AIT.^{1–3}

Because we are the largest VA AIT provider on the West Coast, many of our patients travel great distances for their treatment. Distance from the clinic was measured using patient's listed home address from the WLA VA clinic site using Google Maps. The longest distance traveled was 288 miles. Interestingly, we did not find a statistical significance in distance traveled with adherence to therapy. Patients who lived less than 10.99 miles from the clinic had an adherence rate of 62% (*n* = 34), patients who lived 11 to 25.99

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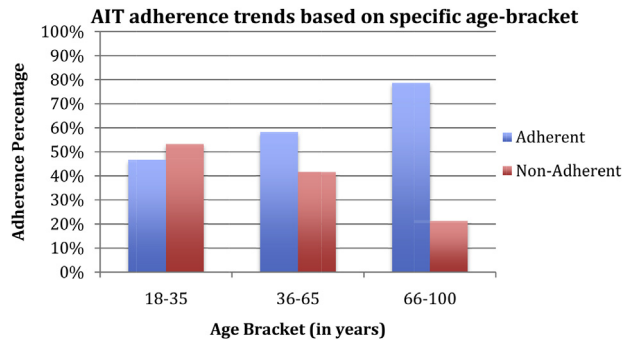


Figure 1. Age was divided into the following age brackets: 18 to 35 years ($n = 15$), 36 to 65 years ($n = 96$), and 66 years or older ($n = 47$); adherence rates were 46.7%, 58.3%, and 78.7%, respectively ($P = .02$). Blue columns indicate the increase in adherence with age.

miles from the clinic had an adherence rate of 70% ($n = 38$), and patients who lived more than 26 miles from the clinic had an adherence rate of 60% ($n = 24$) ($P = .50$). This finding is perhaps attributable to the fact that the patients who traveled a great distance to be evaluated by an allergist started therapy with a greater commitment to adherence or more severe disease.

It is well known that identifying factors that affect adherence is important for any treatment success.⁷ We have identified that younger veterans are at increased risk of nonadherence. Another study is needed with a larger VA population to evaluate the trends observed in this study.

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