

# Sociodemographic Characterization of ECT Utilization in Hawaii

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**Objectives:** Minimal research has been done on sociodemographic differences in utilization of electroconvulsive therapy (ECT) for refractory depression, especially among Asian Americans and Pacific Islanders.

**Methods:** This study examined sociodemographic and diagnostic variables using retrospective data from Hawaii, an island state with predominantly Asian Americans and Pacific Islanders. Retrospective data were obtained from an inpatient and outpatient database of ECT patients from 2008 to 2010 at a tertiary care community hospital on O'ahu, Hawaii.

**Results:** There was a significant increase in overall ECT utilization from 2008 to 2009, with utilization remaining stable from 2009 to 2010. European Americans (41%) and Japanese Americans (29%) have relatively higher rates of receiving ECT, and Filipino Americans and Native Hawaiians have relatively lower rates in comparison with their population demographics. Japanese Americans received significantly more ECT procedures than European Americans.

**Conclusions:** Electroconvulsive therapy is underutilized by certain sociodemographic groups that may benefit most from the treatment. There are significant differences in ECT usage based on ethnicity. Such differences may be related to help-seeking behavior, economic differences, and/or attitudes regarding mental illness. Further research is needed to elucidate the reasons for differences in utilization.

**Key Words:** ECT, ethnicity, Asian Americans, Pacific Islanders, treatment utilization

(*J ECT* 2014;30: 43–46)

Major depression remains common in psychiatric settings, affecting 18 million US residents and 340 million worldwide.<sup>1,2</sup> Two thirds of all suicides are related to depression, and approximately 15% of individuals diagnosed with major depression die by suicide.<sup>3,4</sup> Only half receive any kind of treatment<sup>5</sup>, and of this group, many remain symptomatic.<sup>6</sup> According to the Sequenced Treatment Alternatives to Relieve Depression (STAR-D) trials, only one third of patients remit

with monotherapy<sup>7</sup> and treatment-resistant depression (TRD) is common.<sup>8</sup> Electroconvulsive therapy (ECT) is generally used for treatment-resistant depression, with effectiveness greater than 60%,<sup>8</sup> and remains the “gold standard” despite the advent of newer treatments such as transcranial magnetic stimulation (rTMS).

Sociodemographic differences exist in ECT utilization. Patients receiving ECT were more likely to be older and white individuals with higher incomes and health insurance.<sup>9</sup> We found few studies on the use of ECT by ethnic minorities and none focusing on Asian American and Pacific Islander groups<sup>10–12</sup> despite Asian American and Pacific Islanders representing the fastest growing minority group in the United States.<sup>13–15</sup> Among these ethnic groups, illness is undertreated likely because of stigma and differences in help seeking.<sup>16–18</sup> For example, only 1 in 16 Asian Americans with mental illness seek help compared with 1 in 4 European Americans.<sup>19</sup> Hawaii offers an interesting setting to study ECT utilization, given its relatively higher proportion of elderly, its island state including major rural areas, and its diverse ethnic population of primarily Asian Americans and Pacific Islanders, including Native Hawaiians. Despite trends for a marked increase in utilization of ECT in the past several years nationally, the patient population for this service in Hawaii has not been well characterized. The purpose of this study is to describe and examine ECT utilization rates in a sample of Hawaii's diverse patient population from 2008 to 2010.

## MATERIALS AND METHODS

### Sample Description

A total of 163 unique patients received a total of 2593 ECT treatments between 2008 and 2010. Table 1 presents the sample description including age, sex, ethnicity, insurance type, and primary diagnosis. Table 1 also provides the ethnic distribution of Hawaii's population, with the five major categories of European Americans, Japanese Americans, Native Hawaiians, Filipino Americans, and Other.<sup>14,20,21</sup>

### Procedures

Retrospective data were obtained from inpatient and outpatient databases of ECT patients from 2008 to 2010 at a large community medical center in O'ahu, Hawaii. All procedures were approved by the respective institutional review boards of the hospital and the University of Hawaii at Mānoa. Hospital data associated with all inpatient and outpatient ECT procedures between 2008 and 2010 were coded for variables of age group, sex, ethnicity, insurance, and primary diagnoses, as shown in Table 1. Total ECT procedures were calculated by year across time, and unique patient numbers were filtered across combined years from 2008 to 2010. Univariate and bivariate analyses were performed using IBM SPSS v19.0. One-way analysis of variance was used to determine differences in utilization frequency by year, and multiple comparisons were made using Dunnett T3 post hoc tests. Values of  $P < 0.05$  were considered to

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Received for publication March 1, 2013; accepted August 5, 2013.

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The following disclosures have been made by the authors and may be viewed as potential conflicts of interest.

This research and dissemination were supported, in part, by a grant from The Queen's Medical Center, which also reviewed but did not edit this article. Drs. Onoye and Goebert are faculty of the University of Hawaii John A. Burns School of Medicine, as well as senior scientists at The Queen's Medical Center. Drs. Takeshita and Carlton are also affiliated with The Queen's Medical Center. Dr. Ona was previously affiliated with The Queen's Medical Center. The contents of this article are solely the responsibility of the authors and do not represent the official views, policy, or position of The Queen's Medical Center, the University of Hawaii, the Army, the Department of Defense, or the US Government. A portion of this article was presented at the American Psychiatric Association's Annual Meeting in May 2011 in Honolulu, Hawaii.

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DOI: 10.1097/YCT.0000000000000075

**TABLE 1.** Hawaii Census Data and Sample Description for ECT Utilization in a Hospital Sample

	Census 2000 Hawaii Population, %	Census 2010 Hawaii Population, %	Unique Patients (N = 163), % (95% CI)
Age group, years			
Young adults: 17–31	26.9	NA	8.6 (5.2–13.9)
Adults: 32–61	53.0	NA	58.3 (50.6–65.6)
Elderly: 62+	20.1	NA	33.1 (26.4–40.7)
Sex			
Female	49.8	49.9	60.1 (52.5–67.3)
Male	50.2	50.1	39.9 (32.7–47.5)
Ethnicity			
European American	24.3	24.7	40.5 (33.3–48.2)
Japanese American	16.7	13.6	29.4 (23.0–36.9)
Native Hawaiian*	19.8	26.2	10.4 (6.6–16.1)
Filipino American	14.1	14.5	8.0 (4.7–13.2)
Other (specified)	25.1	21.0	11.7 (7.6–17.5)
Insurance			
Private			30.1 (23.6–37.5)
Medicare			44.8 (37.4–52.5)
Medicaid			14.1 (9.6–20.3)
Government/military			4.3 (2.1–8.6)
Self-pay			0.0 (0.0–2.3)
Other			6.7 (3.8–11.7)
Primary diagnosis			
Depression			75.5 (68.3–81.4)
Bipolar			12.9 (8.6–18.9)
Schizoaffective			8.0 (4.7–13.2)
Schizophrenia			1.8 (0.6–5.3)
Other			1.8 (0.6–5.3)

\*For Census 2000, “Native Hawaiian” included those of one or more races/ethnicities. For Census 2010, “Native Hawaiian” included Native Hawaiians and Pacific Islanders of one or more races/ethnicities.

NA indicates not applicable; Census 2010 figures are not yet available by these age ranges.

indicate statistical significance. Chi-square and 1-way analysis of variance analyses were conducted to examine proportional and mean differences, respectively, in ECT utilization by sociodemographic and diagnostic variables.

## RESULTS

There were 695 ECT procedures performed in 2008, 982 procedures in 2009, and 916 procedures in 2010. There was a significant difference in mean ECT utilization by year,  $F_{2,2590} = 4.84$ ,  $P = 0.008$ . Dunnett T3 post hoc comparisons indicated that ECT utilization in 2009 was significantly higher than that in 2008; all other comparisons were not statistically significant. Table 1 presents the relative rate of ECT utilization by unique patients. There were also similar rates when using the number of ECT procedures (data not shown in table). In terms of diagnoses, depression was the most frequent disorder, at 75.5%, followed by bipolar disorder (12.9%) and schizoaffective disorder (8.0%). Demographic differences existed between the patient sample and Hawaii’s population. Based on age ranges, relative utilization was higher with age, with the elderly (ie, aged 62 years and older) accounting for one third (33.1%) of those who received ECT in the sample, which is higher than the 20.1% representation of this age group in Hawaii’s population. The majority of users were aged between 32 and 61 years (58.3%), followed by the elderly 62 years or older (33.1%), and adolescents and adults aged 17 to 31 years (8.6%).

Women used ECT (60.1%) more than expected based on usual sex ratios. The ethnicity findings clearly indicated ECT utilization more than expected based on population figures for European Americans (40.5%) and Japanese Americans (29.4%) and less than expected for Native Hawaiians (10.4%), Filipino Americans (8%), and “others” (11.7%). The highest insurance type was Medicare (44.8%), followed by private insurance (30.1%) and Medicaid (14.1%). Therefore, the overall profile for someone who received ECT treatment was one who was female, European American or Japanese American, uses Medicare, and diagnosed with depression. However, there were differential patterns of results for European Americans versus Japanese Americans.

Electroconvulsive therapy utilization significantly differed between European Americans and Japanese Americans by age ( $\chi^2_2 = 15.68$ ;  $P < 0.001$ ) and insurance ( $\chi^2_3 = 15.75$ ;  $P = 0.001$ ). For European American users, there was a higher proportion of adults (aged 32–61 years) compared with young adults (aged 17–31 years) and the geriatric elderly (aged 62+ years) (72.7% vs 10.6% vs 16.7%, respectively), whereas for Japanese American users, adults and the elderly were higher in proportion than young adults (47.9% vs 50.0% vs 2.1%, respectively). Excluding self-payers, insurance used by European Americans included private (35.40%), Medicare (36.9%), Medicaid (21.5%), and government (6.2%) compared with Japanese American users who used private (33.3%), Medicare (64.6%), and government (2.1%) insurance. There were no significant differences by sex or primary diagnosis between European American and Japanese American

users. Overall, European American users were primarily diagnosed as having a major depressive disorder, adult group (aged 32–62 years), and with Medicare and private insurance. Japanese American users were also primarily diagnosed with major depressive disorder; however, a bimodal age distribution was identified with different kinds of insurance: 91.7% of Japanese American geriatric users had Medicare insurance whereas 56% of adult users had private insurance ( $\chi^2_4 = 16.31, P = 0.003$ ). Japanese American users of ECT had significantly more average number of treatments than European Americans (21.7 vs 12.6;  $F_{1,112} = 13.29, P < 0.001$ ).

## DISCUSSION

The purpose of this study was to examine ECT utilization of the primary ECT service for an ethnically diverse sample in Hawaii in recent years based on sociodemographic variables and diagnoses. Our findings suggest that there are major gaps in service delivery of ECT for refractory depression. The overall number of individual ECT patients is exceedingly low, considering the potential numbers of patients with refractory depression in a population of approximately 1.4 million.<sup>15</sup> It is doubtful that patients are obtaining ECT in more remote areas given the geographical isolation of the Hawaiian Islands and the lack of services. Our findings showed that patients in this sample who received ECT treatment were more likely to have a diagnosis of depression and are more likely to be elderly women using Medicare with a primary ethnic identity of either European American or Japanese American. Although it is not surprising that more women used ECT, given that the lifetime prevalence of depression is higher for women than that for men, we expected higher ECT utilization overall. The lower-than-expected numbers of ECT for the elderly may be caused by the stigma of ECT and psychiatric treatment and general undertreatment of depression in Hawaii, especially in the elderly.

When considering ethnicity, we expected European Americans to have a relatively higher ECT utilization, given that Asian American and Pacific Islander groups are less likely to seek care and more likely to somatize.<sup>22,23</sup> We found similar rates among European Americans and Japanese Americans in Hawaii. This may be because Japanese Americans in Hawaii are now primarily fourth and fifth generation<sup>15</sup> and, therefore, more acculturated. However, we also found that European American users were younger with Medicare insurance potentially because of a mental health disability. On the other hand, Japanese American patients were significantly older and also received more ECT procedures, which may reflect a delay in treatment, greater disease burden, and need for continuing longer maintenance treatment. Chanpattana et al investigated ECT practices in Japan<sup>24</sup> and Australia<sup>25</sup> through a 29-item questionnaire on the sociodemographic and clinical profile of ECT use. The sociodemographic and clinical profiles of users in Australia and Hawaii were similar, with an older population primarily treated for major depression. However, the Japan ECT profile differed, with similar proportions of younger (aged 45–64 years) and elderly (aged 65+ years) adult patients diagnosed as having schizophrenia and major depression, which may potentially have been caused by lagging practice and education of ECT in Japan.<sup>26</sup>

We also found that few Filipino Americans received ECT treatment and were significantly underrepresented based on the population. Non-Western cultural beliefs about health and illness may influence whether some Asian Americans seek help for symptoms, particularly those that are not physical. More recently immigrated groups such as Filipino Americans may avoid seeking help because of the cultural stigma placed on mental illness and for fear of bringing shame to the family

honor/reputation.<sup>18,27</sup> Furthermore, Asian Americans and Pacific Islanders are significantly less likely than European Americans to mention their mental health concerns to a friend or relative, physician, or a mental health professional.<sup>28</sup> Filipino Americans are often seen by Filipino primary care physicians, rarely referred to psychiatrists, and specialized treatment such as ECT is most likely not offered.

In addition, many immigrant and indigenous peoples reside in rural areas, which may account for low utilization. Rurality has been historically related to socioeconomic class differences as well as geography (distance for driving; neighbor island travel costs). Electroconvulsive therapy is only provided in the urban hub of Honolulu; therefore, access to psychiatric care and ECT services in rural areas may be a problem. In Hawaii, as in other US states, rural residents suffer disproportionately from poor health and mental health outcomes.<sup>29</sup> Hawaii's island geography makes rural health service disparities especially compelling. All areas outside of the metropolitan center of Honolulu on the island of O'ahu are considered rural and are designated as medically underserved areas.<sup>30,31</sup> Because of health professional shortages, rural residents have lengthy wait times for physician visits or opt to travel to urban Honolulu where 80% of the state's health care resources are concentrated.<sup>32–34</sup>

This study is not without limitations. Although the data came from a large tertiary hospital providing a high volume of ECT services in Hawaii, data from other hospitals that may provide ECT services were not included. However, other locations have not consistently provided ECT services. Given the low utilization of ECT by most ethnic groups, we were only able to compare European and Japanese American patients. Only recent inpatient and outpatient data for the hospital were examined, reflecting the expansion to a recognized ECT program beginning 2008. As a result, utilization increased during the study period. Although the ECT program is conducted in the urban center, it provides the majority of ECT service for the greater region of the state, and therefore, we believe that our data are useful to some extent to reflect Hawaii's system.

Clearly, ECT is underutilized by all sociodemographic groups in Hawaii, with greater disparities among immigrant and indigenous groups. Significant changes are needed in mental health services to foster referral and treatment of refractory depressed individuals. Greater efforts should be taken to educate and inform patients, especially ethnic minority patients, of ECT as a treatment option. In addition, more health facilities should offer ECT. For this to occur, comprehensive educational efforts<sup>35</sup> should target all primary care and mental health professionals and trainees<sup>36</sup> on the safety and effectiveness of ECT for treatment-resistant depression as well as a first-line treatment. Psychiatrists, psychologists, nurses, and social workers with ECT knowledge and clinical experience have been found to have positive attitudes about the treatment, which may increase access and referral to those not only with treatment-resistant depression.<sup>37</sup> Furthermore, greater research to understand underutilization among underrepresented ethnocultural groups is needed.

## ACKNOWLEDGMENTS

*Mahalo nui loa to Dr. Loraine Fleming, director of Behavioral Health, for her assistance in this project. Drs. Ona and Onoye have been listed alphabetically as primary authors of this article.*

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