If not well controlled, the effects of diabetes mellitus can lead to numerous systemic problems over time, including neuropathy, nephropathy, heart disease, dental disease, retinopathy, and pregnancy complications. Complications of these conditions include foot ulcers, slow wound healing, necrotic digits or limbs, chronic kidney disease, hypertension and stroke, blindness, macrosomia, spontaneous abortions, and, ultimately, death.

Considerations in the treatment of American Indian/Alaskan Native patients with diabetes mellitus

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In 2007, an estimated 23.6 million people in the United States, approximately 7.8% of the population, had diabetes mellitus.¹ One-and-a-half million of these cases were newly diagnosed, and the majority of the new cases were type 2 diabetes mellitus (T2DM), which is associated with obesity and sedentary lifestyles.

Type 2 diabetes mellitus affects people of different cultures and races variably, and presents different treatment challenges for osteopathic physicians and for patients. American Indians and Alaskan Natives (AIAN) are disproportionately afflicted by diabetes, and together they constitute the ethnic grouping with the greatest incidence of diabetes in the United States. According to the 2000 US Census, 4.3 million adults were classified as AIAN.² The prevalence of diabetes in the adult AIAN population is 16.5%, more than double the rate in the US population as a whole.² The increased incidence of diabetes in the AIAN population makes more of these individuals likely to have complications from this disease.

For practicing osteopathic physicians, the AIAN patient population warrants special attention in terms of diagnosis and treatment. Although each AIAN tribe has distinct genetic characteristics, common factors within the AIAN population may help osteopathic physicians better diagnose and treat these patients.

**Factors contributing to diabetes**

The same factors that contribute to the development of insulin resistance and T2DM in the US population as a whole are also implicated in the development of diabetes in the AIAN population. However, several complicating factors are associated with an increased incidence in AIAN patients.

One study has shown that, even as children, individuals in the AIAN population have a higher rate of obesity than do any other ethnic and racial groups of children in the United States.³ Without intervention, complications of obesity, including diabetes, may develop in these children. Osteopathic physicians need to aggressively pursue and encourage primary prevention of obesity-related conditions by urging their overweight pediatric patients to lose weight. Challenges in achieving healthy weight for AIAN patients may include lack of access to a safe environment in which to conduct physical activity or exercise and accessibility to nutritious foods. Strongly associated with the obesity epidemic is lack of resources to purchase healthy food products. As purveyors of convenient, rapidly prepared food have set up shop near AIAN reservations, healthy eating has become more of a challenge for these people.⁴

Many AIAN tribes face challenges in maintaining traditional lifestyles and food customs. Knowledge of these customs may reside only with certain tribal elders because nontraditional life on the reservation may be the only lifestyle known by younger AIAN individuals. Detrimental socioeconomic factors such as low income, food provided by the Bureau of Indian Affairs, and a shift toward Westernized foods have caused dietary changes that led to diabetes, as was the case with the Pima Indians in the 1990s. Some elders may remember a time prior to the 1950s when a word for “diabetes” did not even exist in their language because the condition was so rare. When the AIAN population was able to subsist from traditional lifestyles on ancestral lands, life was healthier than it is today in some respects, including diet.⁵
Social isolation and lack of access to health care

Individuals in AIAN communities have poor access to health care for many reasons. As a population, AIAN individuals have less formal education than do individuals in the white population. Twenty percent of AIAN households lack an adult with a high school education, and the incomes of more than half of AIAN families are at least 200% below the federal poverty level. A large portion of the AIAN population lacks health care insurance coverage as well. Only 49% of individuals in the AIAN population have employer-provided health care coverage, compared with 83% of white individuals. The total uninsured rate for AIAN patients is 35%, almost triple the rate for white patients.

The Indian Health Service (IHS) was established in 1955 to improve the overall health of AIAN communities. However, this federal agency is able to provide health care to only half of those who lack insurance, due in part to the increasing urbanization of the AIAN population. Most IHS health care providers are located on reservations, so urban-dwelling AIAN individuals cannot benefit from access to the federal health services designed for them.

Many uninsured Americans, whether AIAN, white, or of other races, struggle with access to health care. They are less likely to have a regular clinic or physician, and with insured Americans they are less satisfied with the care they do receive. The high rate of uninsured individuals and increased incidence of diabetes and other chronic diseases constitute a recipe for disaster for the AIAN population.

Increased mortality rates are an extension of poor access to health care. Diabetes mellitus is the third-leading cause of mortality in the AIAN population, the highest mortality ranking for this disease for any ethnic group. When mortality rates are adjusted for age, these rates for the AIAN population are 3.5 times greater than for the rest of the US population and 4 times greater than for white Americans. These great disparities deserve attention. Considering the increased incidence of diabetes in the AIAN population and the limited access of this population to health care, the resultant increase in AIAN mortality is understandable. These issues need to be addressed by osteopathic physicians who serve AIAN communities.

Steps should be taken to improve diabetes education and to control progression of this disease once it is diagnosed. The Special Diabetes Program for Indians (SDPI) has resulted in improved glycemic control in AIAN patients since the program’s establishment in 1997. This program provides federal financial assistance for diabetes prevention and treatment. Initially designed as a 5-year, $150 million program, the SDPI has been extended through fiscal year 2011 at an annual cost of $150 million. These funds have contributed to the development of more than 300 community-directed diabetes programs and more than 60 demonstration projects to help prevent diabetes through lifestyle modification.

In the 13 years since inception of the SDPI, the average glycosylated hemoglobin level of AIAN patients with diabetes has decreased by 13.9%. This decrease has been noted throughout all age groups and translates into large reductions in diabetes-related complications. The SDPI program is an excellent initial step in improving the health of the AIAN population. Continuing to improve diabetes education and extending treatment to all who need health care can help decrease the high morbidity and mortality rates seen in this population.

While seeking to improve treatment, osteopathic physicians need to keep in mind the long history of broken promises made by the US government to the AIAN population. We must strive to build trust in AIAN patients because a lack of trust harms the physician-patient relationship.
Alcohol abuse

The relationship between alcohol and blood sugar levels has long been known, but the mechanism behind this relationship has not been illustrated until recently. Researchers in Sweden demonstrated that ethanol causes increases in blood flow to the endocrine regions of the pancreas, leading to increased insulin release and a resultant drop in blood glucose levels. When these changes occur in an individual who already has difficulty maintaining glucose levels within a normal range, the changes can be even more problematic.

Glucose levels can be especially difficult to control if patients have limited access to health care supplies or if financial limitations preclude the purchase of medications or glucometer test strips. Thus, alcohol use can greatly increase morbidity and mortality levels in individuals with diabetes.

The AIA N population has a higher incidence of alcohol use, abuse, and dependence than does the rest of the US population. In a recent study of alcohol abuse and dependence, researchers conducted face-to-face interviews with more than 43,000 respondents. Using Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) criteria, the researchers found that AIA N study participants had the highest prevalence of alcohol use disorder (12.1%), alcohol abuse (5.8%), and alcohol dependence (6.4%) over a 12-month period, when compared with other ethnic groups.

Furthermore, lifetime prevalence of these conditions among AIA N participants was even higher, with the rate of alcohol use disorder being 43.0%, that of alcohol abuse 22.9%, and that of alcohol dependence 20.1%. All these prevalence rates were higher for AIA N individuals than for whites, African-Americans, Asian Americans, and Hispanic Americans.

Statistics from the IHS extend these alcohol use patterns to mortality. American Indians and Alaska Natives die at higher rates than other Americans from tuberculosis (500% higher), alcoholism (519% higher), diabetes (195% higher), unintentional injuries (149% higher), homicide (92% higher), and suicide (72% higher). (Rates adjusted for misreporting of Indian race on state death certificates; 2003-2005 rates.)

The consumption of alcohol may cause patients to be at higher risk for development of diabetes. Researchers in Japan reported that high levels of alcohol consumption are associated with an increase in prevalence of the metabolic syndrome. The presence of this syndrome is known to place people at higher risk for diabetes, as well as other diseases.

In light of the detrimental effects of alcohol use among individuals with diabetes and the high incidence of diabetes in the AIA N population, serious challenges are associated with this disease in this population. Whether factors that contribute to the high incidence of diabetes and poor glycemic control are inherent in the AIA N population or related to their living conditions and culture is unknown. Regardless, these risk factors exist and are problematic for the health of AIA N individuals.

The tenets of osteopathic medicine mandate that, when providing treatment, osteopathic physicians consider the patient’s body, mind, and spirit. Osteopathic physicians may not be familiar with the unique heritage, customs, and health behaviors of each AIA N tribe, and each tribe may have a different perspective on diabetes treatment. Nevertheless, each patient needs to be assessed in a culturally respectful manner, and the osteopathic physician should ask each patient to explain his or her beliefs and work with each patient to agree on a treatment plan. If these aspects of patient care are not taken into account, all the advice about medical treatment and scientific causes of illness may be to no avail. A useful reference for osteopathic physicians needing to consider such factors as a patient’s culture, ethnic subgroup, and socioeconomic status, and the influence of family and friends is Kleinman’s “Tool to Elicit Health Beliefs in Clinical Encounters.”

Educational programs

A community-based educational program, in conjunction with family interventions, was shown to be effective in changing parental behaviors that lead to obesity in AIA N children. Parents who participated in this program were less likely to give their children sweetened beverages and more likely to continue to breastfeed their infants after 6 months of age. Studies have shown that providing diabetes education that is culturally competent and designed with input from AIA N participants will result in high levels of patient satisfaction and retention of information. If the osteopathic physician does not ask the patient for input on the treatment plan, success in managing diabetes may be more elusive.
Final notes
American Indians and Alaskan Natives face a number of health problems, one of the most severe of which is diabetes. The AIAN population has the highest incidence of diabetes among any ethnic or racial group in the United States. Individuals in this population also have the least access to health care, making successful management of diabetes difficult, and they have the highest incidence of alcohol abuse and dependence, which can further complicate diabetes control.

The high prevalence and severity of diabetes in the AIAN population should prompt us in the osteopathic medical profession to strive to help this population better manage this debilitating, life-threatening disease. 

References