

# The Obesity Epidemic and the Rise of Acanthosis Nigricans – A Case for Lifestyle Medicine

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## INTRODUCTION

The prevalence of obesity in the United States, defined as a body mass index BMI>30, has steadily increased over the last three decades. Approximately 43 million people are considered obese with the prevalence being higher in non-Hispanic Blacks and Hispanic adults.<sup>2-4</sup> Obesity is a multifactorial disease leading to multiple adverse health outcomes affecting several organ systems. As the number of obese individuals increases, so does the prevalence of acanthosis nigricans (AN), with approximately 74% of obese individuals having this condition, making it one of the most common skin findings seen in these patients.<sup>5,6</sup> AN most commonly presents as velvety, hyperpigmented plaques on the neck, groin, and axillae, and less commonly can involve the face. Native Americans and African Americans are the most commonly affected with AN, followed by Hispanics, Asians, and less often, Caucasians.<sup>3</sup>

### Obesity in Skin of Color

Studies have found racial and ethnic health disparities related to obesity. Specifically, darker skin types have been shown to be positively associated with higher risks of obesity, hypertension, and diabetes, especially among Blacks and Hispanics.<sup>2</sup> It is estimated that African American women have the highest rates of obesity compared to other ethnic groups in the United States, and that 4 of 5 African American women are overweight or obese.<sup>7</sup> Racial and ethnic differences in lifestyle and socioeconomic status, along with environmental factors, all play a significant role in the disproportionate prevalence of obesity in the skin of color population.

### Childhood Obesity and Acanthosis Nigricans

The onset of AN has been observed in younger populations due to the paralleled increase in obesity prevalence.<sup>3,8-10</sup> Published data from 2017 suggests that the prevalence of childhood obesity in the United States was as high as 18.5%, affecting 13.7 million children and adolescents.<sup>7</sup> From 1980 to 2010, obesity has increased from 7% to 18% in children 6–11 years old. When looking specifically at racially and ethnically diverse populations, the incidence of AN alone rises to 28%.<sup>3</sup> AN is significantly associated with insulin resistance in children, and is oftentimes present before the diagnosis of diabetes mellitus.<sup>3</sup> Therefore, diagnosis and appropriate diabetes screening is critical in this population. Brickman et al assessed children

in community pediatric offices to determine the prevalence of comorbidities in patients presenting with AN.<sup>11</sup> This study found that 25% of overweight children had AN and 29% of those with acanthosis nigricans had abnormal glucose homeostasis.<sup>11</sup> Another study examined the association of AN and metabolic syndrome and concluded that early intervention in children with AN can be beneficial in decreasing future health complications.<sup>12</sup> AN in childhood is associated with an increased risk of obesity, hypertension, hyperinsulinemia, insulin resistance, and type II diabetes.<sup>9</sup>

### Impact of Lifestyle Changes on Acanthosis Nigricans

The role of lifestyle changes has been underutilized for the treatment of AN in dermatology. Successful treatment of AN must target the etiology of the disease, and since most cases are associated with obesity, weight loss often leads to resolution. Diet, exercise, and counseling are the key pillars of obesity management.<sup>8</sup> Emotional, physical, and economic stress are contributing factors to obesity, oftentimes making it challenging to address in a typical office visit. At the same time, not addressing this causative factor in AN is a disservice to our patients. Dermatologists have the opportunity to encourage patients to sustain healthy lifestyle changes for the treatment of their skin conditions.

AN presents an ideal example of how lifestyle changes can treat one of the most commonly seen skin conditions. Anecdotally, in practice, we see noticeable improvement in AN in gastric bypass patients. In one study of 37 obese patients undergoing gastric bypass surgery, 23 patients also had AN. In this study, all 23 patients had noticeable improvement in AN at a 3-month follow up, likely due to improved insulin resistance and fat loss.<sup>13</sup>

We present a case of a 33-year-old African American woman who presented with a chief complaint of dark discoloration on her face. Physical exam revealed dark brown symmetric velvety thin plaques on the bilateral cheeks consistent with AN. The patient was advised to use topical cosmeceuticals and the importance of weight loss was discussed with an emphasis on healthy lifestyle changes. The topical regimen included cosmeceuticals with kojic acid, arbutin, licorice, and retinol. At

**FIGURE 1.** Patient before, and at 5-month follow-up.

5-month follow up, the patient reported a 30-pound weight loss and almost complete resolution of the hyperpigmented plaques and an overall improvement in her skin tone and texture.

### CONCLUSION

Acanthosis nigricans, a skin condition more common in skin of color, is an ideal example of how lifestyle interventions can dramatically improve obesity related dermatologic diseases. As dermatologists, we need to acknowledge and embrace lifestyle interventions for the prevention and treatment of certain skin conditions. Although challenging, weight-loss needs to be addressed in obesity-related skin diseases including AN, intertrigo, hidradenitis suppurativa, and psoriasis, in addition to topical therapies. Additionally, this case highlights the importance of considering the diagnosis of AN for facial hyperpigmentation as it is often misdiagnosed and treated as melasma or another pigmentary disorder. Dermatologists need to recognize this common condition in obese patients and emphasize the importance of weight loss and healthy lifestyle changes as treatment options.

### DISCLOSURES

The authors report no conflicts of interest.

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