

# Correlation of acanthosis nigricans with insulin resistance, anthropometric, and other metabolic parameters in diabetic Indians

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### ABSTRACT

**Introduction:** Acanthosis nigricans is a non-specific reaction pattern that may accompany obesity, diabetes, excess corticosteroids, pineal tumors, malignancies, and other endocrine disorders. It is considered a cutaneous marker of tissue insulin resistance.

**Aims and Objectives:** To determine the prevalence of acanthosis nigricans in type 2 diabetes mellitus (DM) and its correlation with various anthropometric measurements and insulin resistance by HOMA-IR and other metabolic parameters. **Materials and Methods:** One hundred and fifty consecutive subjects with newly diagnosed type 2 DM, attending the endocrinology OPD of LLRM Medical College, Meerut were studied. Acanthosis was graded based on standard scale of 0-4 as described by Burke *et al.* Anthropometric data were obtained and insulin resistance calculated as HOMA-IR from fasting insulin and fasting blood sugar values. **Results:** The average age of the study population was 45.2 years, with male to female ratio of 1:5. The prevalence of acanthosis in males was 56.67% and in females was 86.92%. The acanthosis neck severity grading had a statistically significant correlation with fasting glucose levels, fasting insulin levels, and insulin resistance values: HOMA-IR, HOMA-S, and HOMA-B ( $P < 0.05$ ). Other acanthosis parameters such as axillary grading, acanthosis at knuckles, and skin tags, did not have a statistically significant correlation with insulin resistance.

**Conclusion:** Acanthosis nigricans neck severity grading correlates well with insulin resistance and can be used as a clinical surrogate for assessment of severity of insulin resistance.

**Key words:** Acanthosis nigricans, insulin resistance, diabetes mellitus

## INTRODUCTION

Acanthosis nigricans is a non-specific reaction pattern that may accompany obesity, diabetes, excess corticosteroids, pineal tumors, malignancies, and other endocrine disorders.<sup>[1]</sup> Acanthosis is characterized by hyperpigmented velvety plaques of body folds and neck. The common sites of involvement include axilla (most common site), along with flexural areas of the posterior neck, groin, along the belt line, dorsal surface of the fingers, in the mouth, around

the areolae, and umbilicus. It is considered a cutaneous marker of tissue insulin resistance.<sup>[2]</sup>

## AIMS AND OBJECTIVES

To determine the prevalence of acanthosis nigricans in type 2 diabetes mellitus (DM) and its correlation with various anthropometric measurements and insulin resistance by HOMA-IR and other metabolic parameters

## MATERIALS AND METHODS

One hundred and fifty consecutive subjects with newly diagnosed type 2 DM, attending the endocrinology OPD of LLRM Medical College, Meerut were studied. People with other endocrine and systemic diseases known to produce acanthosis were excluded from the study. Patients who had taken treatment for diabetes mellitus in the past, patients with intake of drugs such as nicotinic acid, oral contraceptives, and application of topical fusidic acid were

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also excluded from the study. The BMI was calculated by weight in kilograms divided by height in meters squared. Acanthosis was graded based on standard scale of 0-4 as described by Burke *et al.*<sup>[3]</sup> Neck grading 0: Not visible, grade 1 Present: clearly present on close visual inspection, not visible to the casual observer, extent not measurable. grade 2, Mild: limited to the base of the skull, does not extend to the lateral margin of the neck (usually ,3 inches in breadth ), grade 3: extending to the lateral margins, not visible from the front, and grade 4: extending anteriorly.

Acanthosis axilla grading 0: Absent, grade 1: Present on close visual examination, grade 2: Localized to the central portion of axilla, grade 3: Involving the entire axilla, and grade 4: Extends beyond axilla.

Anthropometric data were obtained and insulin resistance calculated as HOMA-IR from fasting insulin and fasting blood sugar values.

## RESULTS

The average age of the study population was 45.2 years, with male to female ratio of 1:5. Males had a higher average age of 56.7 years, whereas females had an average age of 42.16 years. Males had an average BMI of 25.69, whereas the average BMI of females was 29.15. The prevalence of acanthosis in males was 56.67% and in females was 86.92%, and the difference was statistically significant. The acanthosis neck severity grading had a statistically significant correlation with fasting glucose levels, fasting insulin levels, and insulin resistance values: HOMA-IR, HOMA-S, and HOMA-B ( $P < 0.05$ ). It correlates better

than BMI with insulin resistance. Neck texture grading, acanthosis in axilla grading, and presence of acanthosis in the knuckle, elbow, knee joint did not show good correlation with insulin resistance. Also, cervicodorsal fat pad deposition and double chin, classically described as markers of insulin resistance, failed to demonstrate meaningful correlation with HOMA-IR and other metabolic parameters. Presence or absence of skin tags was not having statistically significant correlation with the above parameters.

## CONCLUSION

Acanthosis nigricans neck severity grading correlates well with insulin resistance and can be used as a clinical surrogate for assessment of severity of insulin resistance. It is better marker of insulin resistance than the traditionally used markers like BMI, or buffalo hump.

## REFERENCES

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