**INTRODUCTION**

**Introduction:**

- **Common Carotid Intima-media Thickness (CCIMT) measured by ultrasound is a validated surrogate quantitative marker for atherosclerotic burden.**
- **A recent study proposed a Research Idea to explore potential use of CCIMT in cardiac risk stratification and in the management of MINS.[1]**
- **The study used an advanced method called “echo-tracking” that relies on automated edge detection by radiofrequency signal processing of ultrasound to measure the thickness.[1]**
- **To account for increasing thickness with age, a derived variable i.e. ‘CCIMT Z-score’, is more useful**.
- **CCIMT value ≥1.96 (≥97.5 percentile) was proposed for further management.**

**METHODS**

**Study Design: Cross-sectional, Prospective collected data**

- **A multivariate linear regression analysis was planned with CCIMT z score as dependent variable and following independent variables:**
  - age, gender, body mass index (BMI), waist-to-height ratio (WHR),
  - diabetes mellitus (DM) & current smoking status,
  - total cholesterol-to-HDL ratio (TC-HDL) ratio and serum vitamin D3 levels (ng/mL).
- **These indicators were selected a priori and defined in the protocol.**
- **Setting:** Outpatient vascular wellness clinic
- **Inclusion Criteria:**
  - 20 to 60 years
  - Healthy or mild systemic disease (diabetes mellitus, hypertension etc.) controlled with oral medications
- **Exclusion criteria:**
  - Known cardiovascular disease or cerebrovascular disease
  - Treatment for dyslipidemia
  - History of treatment for vitamin D deficiency.
- **Sample size estimation:**
  - The sample size was adequate as calculated for eight variables to be evaluated, Cohen’s medium effect size of 0.15 and other standard criteria.
- **IBR approval and Trial Registration:**
  - Study protocol was approved by the Institute Ethics Committee at Indo-US Hospital, Hyderabad, India.
  - Registered prospectively in a clinical trial registry in India (http://ctri.nic.in).

**RESULTS**

- **A CCIMT z score of ≥1.96 (≥97.5 percentile) is defined as highly abnormal that requires immediate attention and further evaluation.**[1]
- **There were 26 (22.2%) individuals in this category and 14 (23.3%) in those <40 y.**
- **Of the variables tested, current smoking, TC-HDL ratio and vitamin D3 were significantly associated with high CCIMT z score.**
- **Analysis of variance revealed model P value of 0.0003.**
- **Variance inflation factor analysis did not reveal existence of multicollinearity issue among the tested variables.**
- **Analysis using the three significant variables yielded the following linear model to estimate the score:**
  - **CCIMT Z score = 0.80 + (0.841 x current smoking=1) + (0.156 x TC-HDL ratio) – (0.263 x vitamin D3 blood level in ng/mL).**
- **R square was 0.21**.
- **Evaluation of standardized coefficients revealed weightage for smoking, TC-HDL ratio and vitamin D3 in that decreasing rank order (Figure)**.

**DISCUSSION & REFERENCES**

- **The method is “accurate” and “reliable” compared to other methods of CCIMT measurement.**
- **Decreased vitamin D3 concentrations in blood were associated with serious cardiovascular events after noncardiac surgery[4].**
- **Smoking and high TC-HDL ratio (normal <4.5) are known risk factors for atherosclerosis.**
- **Current study showed low serum vitamin D3 is also associated with high CCIMT Z score.**
- **Vitamin D3 deficiency is associated with incident cardiovascular disease and there is graded increase in risk across categories of deficiency for levels 10 to <15 ng/mL and for levels <10 [5].**
- **Deriving CCIMT Z score either by direct measurement by ultrasound or by estimating from the linear model e.g. as shown in the Table may identify a sub-set (i.e. with score ≥1.96) among ‘low risk’ individuals in whom stratification and/or monitoring with biomarkers may be beneficial.**
- **CCIMT seems to be an independent variable for predicting MINS.**

**REFERENCES**


Author disclosures: Conflicts of Interest: None