

Retrospective Study of Eccentric Evaluation of Biological Age in Rural Population of India Based on its Social-Demographic Parameters

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ABSTRACT

BACKGROUND: The preliminary way people define their age which likely based on the amount of time elapsed from the birth in terms of the number of years, months, days etc., which said to be the 'Chronological Age'. Regardless of the chronological age, the physical condition of the body determines the biological age or physiological age or functional age, which depends on several factors such as, genetics, cellular functions, lifestyle diseases and disorders, nutritional behavior, gut microbiome and other clinical conditions. The social-demographic parameters like population density, poverty in population groups, education, unemployment, poor food habits and hygiene and occupation-specific physical activities. It has evidenced from objective measures within and outside the body that the biological age is different from the actual chronological age.

AIM: Idiosyncratic evaluation of biological age in rural population of India based on its social-demographic parameters.

MATERIAL AND METHODS: A population-based retrospective study was conducted in a rural area and collected data in the form of a secondary source. Biological age was measured by using a standard instrument. Individuals having age 18 to 50 years old included and any other co-morbid medical or surgical illness and physically handicapped participants were excluded.

RESULTS: We observed that 26% of people are preferred to only veg food in their life. The proportion of non-vegetarian people is larger than vegetarian people. Correlation between biological age, chronological age and Body Mass index (BMI) was positive as compared to the systolic blood pressure, diastolic blood pressure and blood sugar respectively. The respondents' increasing BMI showed that about 25% were obese or overweight in a rural area.

CONCLUSIONS: The relation between social-demographic parameters and the biological ageing process has been studied for the rural population. The study provided a statistically significant explanation about the complex interaction between different parameters taken into consideration under biological ageing.

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A variable lifestyle may be to a large extent changed due to the control measures, with the subsequent risk of sedentary behaviors, modification in food consumption, smoking and sleeping habits^{10,11, and 12}. A parameter habits largely disturbed terminology chronological age and biological age^{13,14}. Here we have taken a review of various studies and observed there was an association between sleep in continuation or sleep instability and obesity due to the increase in the discharge of pro-inflammatory cytokines by the increased visceral adipose that could supply to alter the sleep-wake rhythm¹⁵. The diet affecting on the features of sleep. On 172 middle-aged adults conducted cross-sectional study good sleepers had higher adherence to the Mediterranean diet (MD) and inferior BMI compared to poor sleepers¹⁶.

Dr Leonardo da Vinci suggested the role of biomarkers in the form of trees a ring per annum cut based on growth effect on the thickness and density of considered the ring. The number of annual growth rings of an individual tree measures the tree's chronological age in years. This Tree rings initially called biomarker^{17,18}. In general peoples, height, weight, BMI, the strength of muscles, skin features, hair color are familiar phenotypic deviation that is correlated, but poorly, with CA, RLE, and forecast of health or disease.

The Biomedical experts observed some of the parameters that predict morbidity and mortality more accurately as compared to the CA, by considering some biological parameters will measure ageing more precisely than CA¹⁸. If we are looking to back last two decades, lots of biomarkers related to ageing have been projected, with inadequate success¹⁹.

In Duke University at Durham, North Carolina conducted the longitudinal study based on the seven methods²⁰. To find out the BA with help of repeated-measures physiological and genomic data. They are studied approximate eleven measures telomere-length and erosion, three epigenetic-clocks and their ticking rates, and three biomarker-composites respectively. A very little agreement between different measures of biological ageing. We next compared associations between biological ageing measures and outcomes that neuroprotective therapies for modification such as physical functioning, cognitive decline, and subjective signs of ageing, including an aged facial look. The 71– cytosine-phosphate-guanine epigenetic clock and biomarker combined were related to ageing-related outcomes. However, there are various approaches to enumerate biological age that may not measure the same aspects of the ageing process.

The study was designed to evaluate there was any relation between the BA and CA. Various studies carried out on the BA which has shown, the some of the factor affecting on the BA. Therefore, present study observed, what are the parameters affected on the BA.

MATERIALS AND METHODS:

A retrospective study was conducted in a rural area at KIMS DU, Karad, and Maharashtra. The study was approved by the ethics committee and informed consent was obtained. Biological age was measured by using a calibrated instrument Karada Scan Body Composition Monitor HBF-358-BW. The whole process was monitored by the expert physician at Krishna Hospital, Karad. Information regarding the personal data was collected with the help of a pre-tested questionnaire from respondents. In this study, we have included individuals having age group between 18 to 50 years. Individuals having any other co-morbid medical/surgical illness and physically handicapped participants were excluded in the study.

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| | | | |
|----|---|---------|-----------------------|
| 02 | BMI and Biological age | 0.4823 | 0.0001 |
| 03 | Biological age and Bold Sugar | 0.1787 | 0.0724 ^{nsq} |
| 04 | Biological age and Systolic blood pressure | 0.04835 | 0.6294 ^{ns} |
| 05 | Biological age and Diastolic blood pressure | 0.0690 | 0.4903 ^{ns} |

Note: -ns: -not significant, nqs: not quite significant

According to the WHO guideline, the present study revealed the BMI of participants as 16.66%, 43.33%, 14% and 12% for underweight, appropriate weight, class I obesity and Class II obesity as overweight, respectively⁸.

Table 3. Classification of Body Mass Index

| General Classification | Cut of Levels | Frequency | Percentage |
|-----------------------------|-----------------------------|-----------|------------|
| Underweight | < 18.5 kg/m ² | 20 | 16.66 |
| Normal weight | 18.5-24.9 kg/m ² | 52 | 43.33 |
| Class I obesity | 25.0-29.9 kg/m ² | 17 | 14.16 |
| Class II obesity overweight | 30.0-39.9 kg/m ² | 12 | 10 |
| Class III extreme obesity | 40 kg/m ² | 01 | 0.83 |

Statistical Analysis: -

The Fitted Models

$$CA = 0.389 + \beta_1 \text{BMI} + \beta_2 \text{RM_Cal} + \beta_3 \text{Body fat} + \epsilon \dots \dots \dots [A]$$

In equation A we were comparing

$$BA = 0.567 + \beta_1 \text{BMI} + \beta_2 \text{RM_Cal} + \beta_3 \text{Body fat} + \epsilon \dots \dots \dots [B]$$

Table 4. Comparison of Models

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics | | | | | Durbin-Watson |
|-------|------|----------|-------------------|----------------------------|-------------------|----------|-----|-----|---------------|---------------|
| | | | | | R Square Change | F Change | df1 | df2 | Sig. F Change | |
| CA | .389 | .151 | .125 | 15.690 | .151 | 5.830 | 3 | 98 | .001 | 2.064 |
| BA | .567 | .322 | .286 | 13.72195 | .322 | 9.111 | 3 | 96 | .000 | 2.189 |

Table 4. Comparison of Models

We had observed that, there was autocorrelation between the variable in Model B as compare to the Model A. r² value of the Model B or BA to be large as compare to the Model A or CA. There was more variation in model B.i.e. It means that BMI, RAM Cal. Body fat was auto correlated with the BA.

DISCUSSIONS:

A total of 102 participates of data Analyzed in this study. Collated data in the form of secondary sources. Selected data in the form of record there was no scope of some variables to be including such as physical activity, habits, types of job, income sours etc. or some other antroparametric parameters⁰⁹. We can observe that, more than 73% of participates recommended mixed types for food taken in his rutting life.

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