# Age Changes In Physiological Variables And Muscular Strength Among Meitei women of Imphal West District , Manipur, India.

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**Citation**

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**Abstract**

In the present study, age changes in physiological variables in Meitei women (the most populous community of Imphal valley, Manipur, India) have been reported.Cross sectional sample of 200 females ranging from 20-80 years have been incorporated in the present study. There is not much change in Heart rate with growing age. However, a considerable change in Blood Pressure and Lungs function has been observed.

## INTRODUCTION

Ageing is a natural phenomenon, a biological process. Study of ageing process is one of the most important aspects of physiological anthropology. The term ageing is generally used to mean simply growing older and ageing changes being those changes related to increasing chronological age, regardless of when in the life span they occur. Thus, the onset of puberty might be described as ageing changes. Physiological variations are found among different populations. It is believed that blood pressure level is supposed to vary with age, sex, disease, nutrition, urbanization, occupation, drugs, etc. (Banerjee [1,2] , Boyce et al [3] , Cruze-Coke et at [4] Doyle et al [5] , Hanna et al [6] , Hurizinga [7] , Scotch [8] and Weitz [9] ). Determination of Vital Capacity has been carried out in adult Indians of both sexes and they have been well reviewed by Rao et al. [10] . Krishnan and Vareed [11] opined that there is a gradual increase in Vital Capacity from 18 to 21 years when it reaches maximum and then a decline.

In India, Talwar et al. [12] , conducted a study on age changes in physiological variables in relation to anthropometric traits among Rajput boys and girls ranging in age from 10 -17 years. In the same year, Sethi et al. [13] conducted a study on body composition and blood pressure with relation to ageing among Khatri women.

In the present paper, an attempt has been made to bring out variations, if any in various physiological parameters and muscular strength among the Meitei females in relation to ageing changes.

## MATERIALS AND METHODS

Apparently 200 healthy Meitei females ranging in age form 20-79 years, inhabiting the Imphal West District of Manipur were studied. Meitei is the most populous community of the Manipur state inhabiting mainly the central valley region. Racially, they are predominantly Mongoloid and linguistically belong to Tibeto-Burman family. Meitei have their own tradition of worshipping their ancestors and different deities. However, after proselytization, majority of the Meiteis follow Hinduism as their religion. There is also a group of revivalists who follow pre-hindu beliefs and practices. They are popularly known as ‘Meitei Marup'. Women posses the rare quality of balancing their own religion and religion coming from outside. They are loyal to both. They celebrate both the festivals of Meiteism and Hinduism.

Blood pressure was determined by using sphygmomanometer with standard cuff and stethoscope, pulse rate was measured by palpation of the redial artery at the wrist, the numbers of beats occurring in 15 seconds are being counted and multiplied by 4 to give the rate per minute. Grip strength and vital capacity values were recorded using grip dynamometer and micro-spiro meter respectively.

## RESULTS AND DISCUSSION

Mean values along with Standard Deviations for all the

physiological measurements and muscular strength of right and left hand are given in table 1 and age group wise comparison for all traits are given in table 2.

**Figure 1**

Table 1: Mean and Standard Deviation of Physiological variables and Muscular Strength of Right and Left hands.

| Age group | No | PR (b/m) | SBP (mmHg) | DBP (mmHg) | FVC liter | $FEV_{1.0}$ liter | MS of Rt hand (Kg) | MS of Lt hand (Kg) |
|---|---|---|---|---|---|---|---|---|
| 20-29 | 43 | 82.9 ± 8.3 | 111.4 ± 8.4 | 72.6 ± 7.6 | 1.77 ± 0.3 | 1.6 ± 0.4 | 15.6 ± 3.4 | 15.1± 3.7 |
| 30-39 | 43 | 84.7 ± 11.6 | 111.0 ± 14.2 | 78.3 ± 8.6 | 1.85 ± 0.3 | 1.6 ± 0.3 | 16.8 ± 3.4 | 16.3± 3.4 |
| 40-49 | 44 | 82.1 ± 13.6 | 112.9 ± 12.9 | 75.0 ± 12.5 | 1.79 ± 0.3 | 1.5 ± 0.3 | 14.6 ± 6.63 | 15.1± 3.8 |
| 50-59 | 32 | 82.3 ± 11.4 | 122.9 ± 18.1 | 80.6 ± 9.4 | 1.56 ± 0.3 | 1.33 ± 0.4 | 14.0 ± 3.24 | 13.9± 3.1 |
| 60-69 | 24 | 79.1 ± 11.3 | 124.9 ± 16.6 | 79.4 ± 6.5 | 1.45 ± 0.3 | 1.22 ± 0.3 | 19.9 ± 3.75 | 14.5± 3.4 |
| 70-79 | 14 | 80.0 ± 11.7 | 142.1 ± 6.0 | 80.7 ± 11.0 | 1.35 ± 0.3 | 1.05 ± 0.3 | 10.8 ± 2.59 | 12.2± 2.8 |
| Total | 200 | 82.4 ± 11.2 | 121.0 ± 15.5 | 77.7 ± 9.2 | 1.63 ± 0.3 | 1.41 ± 0.3 | 15.3 ± 3.84 | 14.6± 3.7 |

It has been observed that the mean value of pulse rate in Meitei women is 82.40±11.27 b/m. Though an irregular trend has been observed in the pulse rate, there is no significant difference on age group wise comparison (table 2). The reason may be that the physical activity level of each age group is different at the same time the pulse rate is not too much affected by aging. The average Systolic Blood Pressure (SBP) of the population has been found to be 121.00 ± 15.55 mmHg. Though the mean value of SBP increases with the increase in age. This has shown that SBP has a correlation with age. Similar findings have been also reported by Rao et al. [14] , Venkataramana et al. [15] and Kotchen et al. [16] . The reason behind the increase of SBP with age may be the loss of elasticity of blood vessels with increasing age as well as the fat deposit tendency of females with advancing age. The average value of Diastolic Blood Pressure (DBP) in the population is 77.79 ± 9.29 mmHg. Unlike the SBP, DBP experienced an irregular trend and showed only five significant differences on age group wise comparison (table 2). Similar finding have been reported by Banerjee [17] . DBP is more stable than the SBP (Chatterjee [18] ). The average values of Force Vital Capacity (FVC) and Force Expiratory Ratio in one second ($FEV_{1.0)}$ are 1.63 ± 0.37 liter and 1.41 ± 0.37 liter respectively. FVC increases up to the age of 39 years thereafter it experienced a decreasing trend with increase in age. Similar trend has also been observed for $FEV_{1.0}$. as reported by Krishnan and Vareed [11] .

**Figure 2**

Table 2: Test of significance (t-test) values of age group wise comparison for all the parameters.

| Comparisons | PR | SBP | DBP | FVC | $FEV_{1.0}$ | MS of Rt hand | MS of Lt hand |
|---|---|---|---|---|---|---|---|
| – 29 Vs 30 - 39 | 0.79 | 2.20* | 3.30* | 1.02 | 0.26 | 2.33* | 2.21* |
| - 29 Vs 40 - 49 | 0.36 | 0.63 | 1.08 | 0.26 | 1.42 | 1.73 | 0.02 |
| – 29 Vs 50 – 59 | 0.25 | 8.89* | 3.39* | 2.28* | 3.58* | 2.08* | 1.61 |
| – 29 Vs 60 – 69 | 1.44 | 3.70* | 3.87* | 3.48* | 4.77* | 2.86* | 0.80 |
| – 29 Vs 70 – 79 | 0.88 | 4.94* | 2.57* | 3.13* | 5.23* | 5.48* | 3.18* |
| -39 Vs 40 – 49 | 0.96 | 1.40 | 1.47 | 0.85 | 1.79 | 2.91* | 2.26* |
| – 39 Vs 50 – 59 | 1.15 | 2.70* | 1.06 | 3.37* | 4.06* | 3.65* | 3.80* |
| – 39 Vs 60 – 69 | 1.89 | 1.94 | 0.56 | 4.65* | 5.35* | 4.18* | 2.77* |
| – 39 Vs 70 – 79 | 1.06 | 3.89* | 0.73 | 3.84* | 5.63* | 4.18* | 2.77* |
| – 49 Vs 50 – 59 | 0.08 | 5.09* | 2.23* | 2.67* | 2.28* | 0.85 | 1.50 |
| – 49 Vs 60 – 69 | 0.97 | 3.05* | 1.91 | 3.95* | 3.47* | 4.82* | 0.71 |
| – 49 Vs 70 – 79 | 0.58 | 4.58* | 1.63 | 3.38* | 4.20* | 4.33* | 3.07* |
| – 69 Vs 60 – 69 | 1.04 | 0.58 | 0.56 | 1.11 | 1.11 | 1.08 | 0.62 |
| – 59 Vs 70 – 79 | 0.64 | 3.16* | 0.02 | 1.51 | 2.29* | 3.48* | 1.83 |
| – 69 Vs 70 – 79 | 0.21 | 2.48* | 0.40 | 0.72 | 2.21* | 2.03* | 2.20* |

* Significant Difference

Regarding the age group wise comparison, a total of 9 and 11 significant differences have been observed for FVC and $FEV_{1.0}$ respectively out of 15 comparisons (table 2).

This shows that the age change in lungs function is considerable. The reason behind this fact may be impairment of pulmonary elasticity and decrease mobility of chest cage as also suggested by various scholars. The average value of muscular strength of right and left hand has been found to be 15.32 ± 3.48 Kg and 14.67± 3.75 Kg respectively. An irregular trend in muscular strength has been observed. The reason may be the difference in the physical activity levels of each age group. Most of the age group wise comparisons, for right hand experienced significant difference while for left hand, only eight significant differences have been observed. This clearly shows that hand grip strength is not much influenced by age but is determined by the level of physical activity.

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## References

1. Banerjee B. The Effect of Occupation on Blood Pressure. Journal of Indian Anthroplogical Society. 1984; 19 (3): 286-290.
2. Banerjee B. Oral Contraceptives and Blood Pressure.: A Study on
Interrelationship. The Journal of Family Welfare, 1988; XXXIV(3):44.50.
3. Boyce A.J., Attenborought R.D., G.A. Harrison. Variations in Blood
Pressures in a New Guinea Population. Ann Hum Biol 1978;5:313-317.
4. Cruze-Coke R., Coverrubias E. Factors Influencing Blood Pressure in a
Rural Chilean Community. Lancet 1962; Vol. 2. 1132- 1137.
5. Doyle A.E. and R.R.H. Lovell. Blood Pressure and Body Build in Men in
Tropical and Temperate Australia. Clin Sci 1961; 20:243-247.
6. Hanna J.M. and P.T. Baker. Biocultural Correlates to the Blood Pressure of
Samoan Migrant in Hawali, Hum Biol 1979; 51:148-490.
7. Hurizinga J. Casual Blood pressure in Populations. In the Human Biology of Environmental Change, Ed. By Voster, D. Urwan, London. 1972
8. Scotch N.A.. A. Preliminary Report on the Relation of Sociocultural Factors to Hypertension among the Zulu. Ann New York Acad Sci, 1960 ; 84: 1000-1009.
9. Weitz C.A. Blood Pressure at Rest and During Exercise among Sherpas and Tibetan Migrants in Nepal. Soc Scient Med, 1982; 16: 223.
10. Rao M.N.,Sen GuptaA., Saha P.N.,and Sita Devi A. Physiological norms in Indians: Pulmonary capacities in health. Special Report Series No. 38, Indian Council of Medical Research, New Delhi. 1961
11. Krishan B.T. and Vareed C. Ind. Jour.Med.Res., 1932; 19,1165.(cited by Rao et al.,1961).
12. Talwar I, Bajwa P, Kaur P. Age Changes in Physiological Variables and their relationship with Anthropometric Traits among Rajput Boys and girls. Abstract, P.C. Biswas Centenary National Seminar 2003.
13. Sethi H.K., Singal P, Sidhu LS, Bhatnagar DP. Body Composition and Blood Pressure in working and non working women with special reference to Ageing. Abstract, P.C. Biswas Centenary National Seminar 2003.
14. Rao B. Dharma, Rao VLN, Busi B.R. A study of growth in Physical and Physiological Variables Among Koya Dora Tribal boys of Andhra Pradesh. J. Hum. Ecol. 1997 (2):95-100.
15. Venkatramana P., C.Geetha Vani and P. Chengal Reddy : Association of Body Mass Index, Body Fat distribution and Fat Patterning with Blood Pressure in two population of Andhra Pradesh. J.Hum.Ecol.,12(1):63-68(2001)
16. Kotchen, J., McKean, H.,Neill,M. and Kotchen,T. : Blood pressure trends associated with changes in height and weight from early adolescence to young adulthood.J.Clin.Epidemol.,42:735-741 (1989).
17. Banerjee Bikash. Body Build, Body Surface Area and Blood Pressure in a Rural Marine Fishing Population of Orissa. J. Phys. Anthrop. and Hum. Genet., 2004; 23(1): 85-95
18. Chatterjee C.C.: Human Physiology. 1977; Vol. 1.Medical Allied Agency Calcutta. Cited by Martha et al. in Hum. Biol. June 1989, Vol. 61, No.3, Pp 415-425

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