

LETTER TO EDITOR

DECREASE IN CARDIOVASCULAR PARASYMPATHETIC FUNCTION TESTS A DECADE EARLIER IN FEMALES

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Sir,

The autonomic nervous system is vital for homeostasis and its potency is gradually reduced with increasing age (1). Because ANS facilitates adaptation to physiological stress, autonomic insufficiency in elderly may not manifest itself under normal resting conditions, yet may occur in response to changes in homeostasis (2). In old age though both sympathetic and parasympathetic are affected but parasympathetic involvement appears to be more frequent than sympathetic (1).

Age-related autonomic neuropathy may produce clinical symptoms directly or result in subclinical disease, complicate therapeutic intervention in a variety of diseases (e.g. sympatholytic drugs in hypertension, aggressive insulin therapy) or decrease the safety margin upon which superimposition of additional insults (e.g. diabetes) produce symptomatic disease (2).

Because of growth of ageing population the study of effect of age and sex on parasympathetic autonomic function tests in healthy subjects (18-65 years) is important. 152 healthy subjects of Indian origin of both sexes in the age range of 18 - 65 years were randomly selected among the staff & students of BLDEA's Shri B. M. Patil Medical College Hospital & Research Centre, Bijapur. The entire sample is divided into four groups

according to <http://medical-dictionary.thefreedictionary.com/middle+aged>.

Group I	18-19 years	Adolescence	37 (Male=18, Female=19)
Group II	20-34 years	Early-adulthood	40 (Male=31, Female=9)
Group III	35-54 years	Middle-adulthood	38 (Male=22, Female=16)
Group IV	55-65 years	Late-adulthood	37 (Male=20, Female=17)
Total			152 (Male=91, Female=61)

The Parasympathetic activity was assessed by Heart Rate response 1) to Valsalva maneuver 2) to deep breathing, 3) to standing using student physiograph at 3 pm two hrs after lunch.

Statistical analysis was done using Student's t test and one way ANOVA, with the help of SPSS. All values are presented as mean±SD.

1. Heart rate response to Valsalva maneuver (Valsalva ratio = longest R-R interval after strain/shortest R-R interval during strain).

We observed significant lower values in females from 35-65 years.

Zeigler D et al did not find any significant dependence on gender (3).

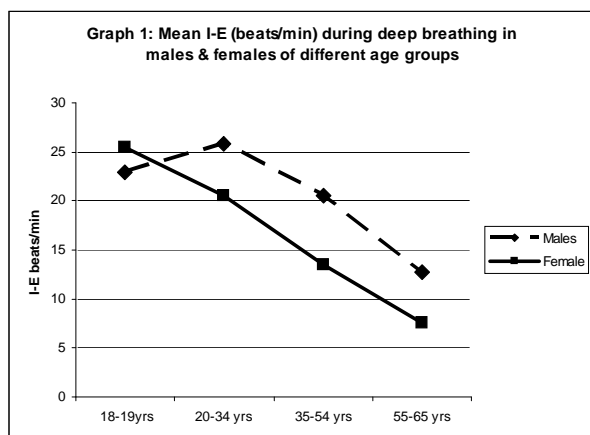
TABLE I: Mean Valsalva ratio in males & females of different age groups.

Groups	Males	Female	P value
Group I (18-19 yrs)	1.51±0.36	1.50±0.39	0.94
Group II (20-34 yrs)	1.49±0.34	1.37±0.29	0.309
Group III (35-54 yrs)	1.55±0.41	1.24±0.19	0.005**
Group IV (55-65 yrs)	1.31±0.22	1.17±0.08	0.017**
One way ANOVA test	0.12	0.004**	

*P:<0.05: Significant, **P:<0.01: Highly significant, ***P:<0.001: Very highly significant.

Piha S J found HR response to VM was higher in females over 50 yrs than in males of same age (4).

2. Heart rate variation during deep breathing (I-E)



In both genders there is gradual & very highly significant (P=0.000) reduction in mean I-E (beats/min) during deep breathing with advancing age.

The heart rate response to deep breathing has become abnormal almost a decade earlier in females compared to males.

However, Piha S J found decrease in heart rate response to deep breathing with age but no difference in men & women (4).

3. Immediate heart rate response to standing (30:15).

TABLE II: Immediate heart rate response to standing (Mean 30:15 ratio) in males & females of different age groups.

Groups	Males	Female	P value
Group I (18-19 yrs)	1.31±0.22	1.29±0.13	0.81
Group II (20-34 yrs)	1.34±0.15	1.31±0.34	0.77
Group III (35-54 yrs)	1.23±0.19	1.17±0.11	0.19
Group IV (55-65 yrs)	1.15±0.16	1.09±0.12	0.26
One way ANOVA test	0.003**	0.003**	

*P:<0.05: Significant, **P:<0.01: Highly significant, ***P:<0.001: Very highly significant.

We have found a gradual & significant decrease in the 30:15 ratio in males & females of 20 to 65 yrs.

It has been established by a number of investigators that cardiovagal baroreflex sensitivity starts to decline from 20s & is reduced to almost zero in the 70s & 80s. Stiffening of the barosensory vessel wall with age accounts to a large extent for the age related decline in the autonomic sensitivity (5).

Different investigators suggested that loss of vagal tone occurs gradually as age advances (1). C Neumann & H Schmid found that the heart rate response in men & women did not differ (6).

Braune S & coworkers who found that gender has an influence on heart rate

response to deep breathing (7). Turner MJ & coworkers, Masari Amano and coworkers found better autonomic function in females in comparison to males (8, 9). Arora RR and coworkers found that the females decline at a greater rate than the males (10).

The results of the present study showed that decrease of parasympathetic nerve functions occurred in apparently healthy subjects as age advances from 18-65 years

more so after 35 years in both genders. The heart rate response to deep breathing which appears to be a sensitive indicator of parasympathetic function has become abnormal almost a decade earlier in females than males. Measurement of heart rate response to deep breathing which can be made with an electrocardiographic apparatus provides a simple accurate diagnostic & prognostic screen for autonomic neuropathy in clinic.

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