



Some Aspect of Visual Functions and Serum Retinol Levels in young adults and middle aged subjects

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Introduction

Most aspects of visual function decline with increasing age, even in subjects with normal, healthy eyes. The earliest sign of vitamin A deficiency is a decrease in dark adaptation or night vision. Since dark adaptation reflects the functional consequences of vitamin A deficiency, it is used as one of the physiologic indicators of vitamin A status. The comparison of the dark adaptation and serum retinol level was a potentially useful method of studying the basic nature of the aging process in vision. The effect of advancing age on dark adaptation was studied by using classical testing (Carney and Russell, 1980, Pitts, 1982) and rapid dark adaptation test (Vinton and Russell, 1981). In classical test, a significant rise in final threshold was observed with the increases in age (Pitts, 1982). Vinton and Russell (1981) also reported the longer dark adaptation time in elderly people. The previous western studies have reported that older adults exhibit loss in scotopic and photopic sensitivity: the decline in the rate of scotopic sensitivity was about double that of photopic sensitivity during adulthood (Jackson and Owsley, 2000).

Aims and Objectives

Aims

- To find out the influence of serum retinol and age on some aspects of visual function in Myanmar male subjects.

Objectives

1. To determine dark adaptation times of two different age groups: young adults (18-25 years) and middle-aged subjects (40-60 years)
2. To map visual fields of two different age groups: young adults (18-25 years) and middle-aged subjects (40-60 years)
3. To compare dark adaptation times of the above two age groups
4. To compare the sizes of visual fields of the above two age groups
5. To find out the relationship between dark adaptation time and serum retinol level
6. To find out the relationship between visual field and serum retinol level

Method

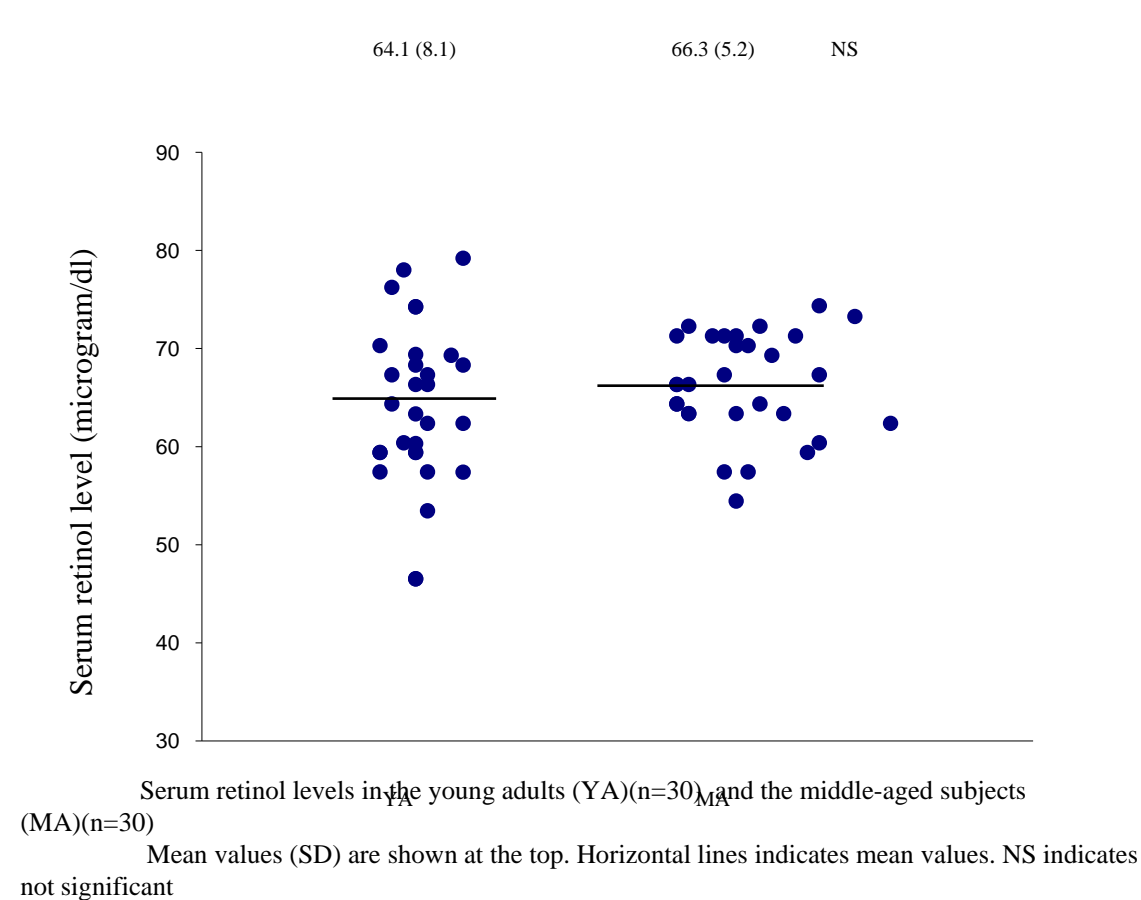
Dark adaptation time (DAT) was determined by a rapid dark adaptation test adopted from Thornton (1977).

Visual field was assessed by manually setting kinetic perimetry.

Serum retinol level was determined by colorimetric method using trifluoroacetic acid (TFA).

Results

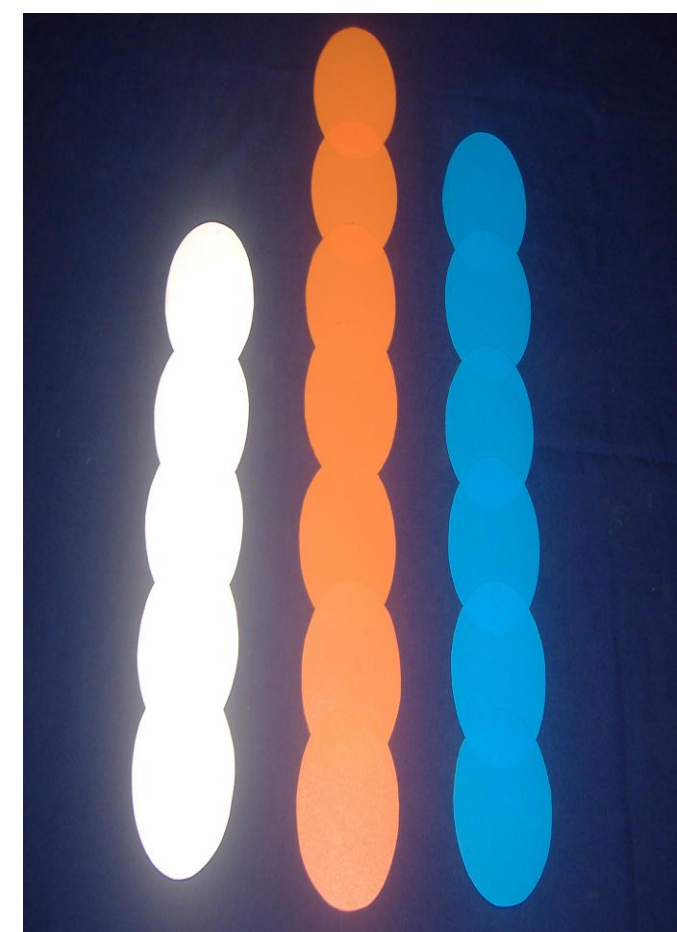
1. There was a significant positive correlation ($r=0.62$)($P<0.05$) between DAT and age of the subjects. This indicates that older subjects had longer DAT.
2. There was a significant negative correlation ($r=0.4$)($P<0.05$) between DAT and serum retinol level in middle-aged subjects whereas no such correlations were found in young adults and in combined group.
3. Visual field impairment in both sides was significantly ($P<0.05$) higher in middle-aged subjects when compared with those of young adults. A significant association ($P<0.01$) was also observed between visual field impairment and age differences.



Conclusion

The present results indicated that there was an age-related change in visual functions irrespective of serum retinol level. Since prolonged dark adaptation and reduction in visual field were observed in the middle-aged subjects, the middle-aged take great care while driving at night or working in the dark. Dark adaptation test indicates early changes in vitamin A status. The determination of serum vitamin A is time consuming but RDAT is simple, portable and economical. So community-based research on dark adaptation and vitamin A status in high-risk person like pregnant women and children should also be done by using this RDAT. Early diagnosis and proper treatment could reduce the incidence of visual impairment in the older population and promote preventative ophthalmic care in an aging population.

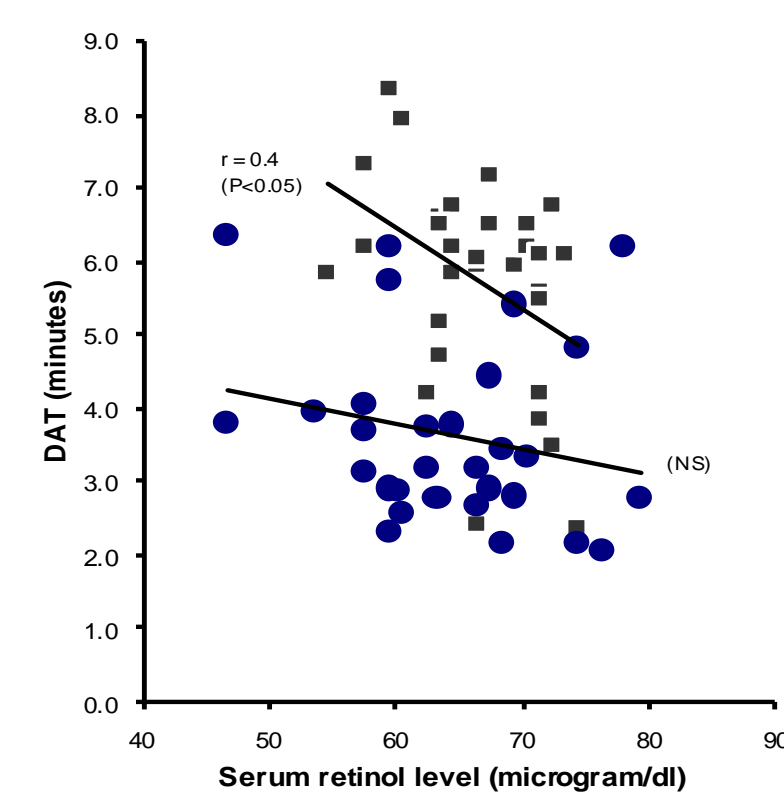
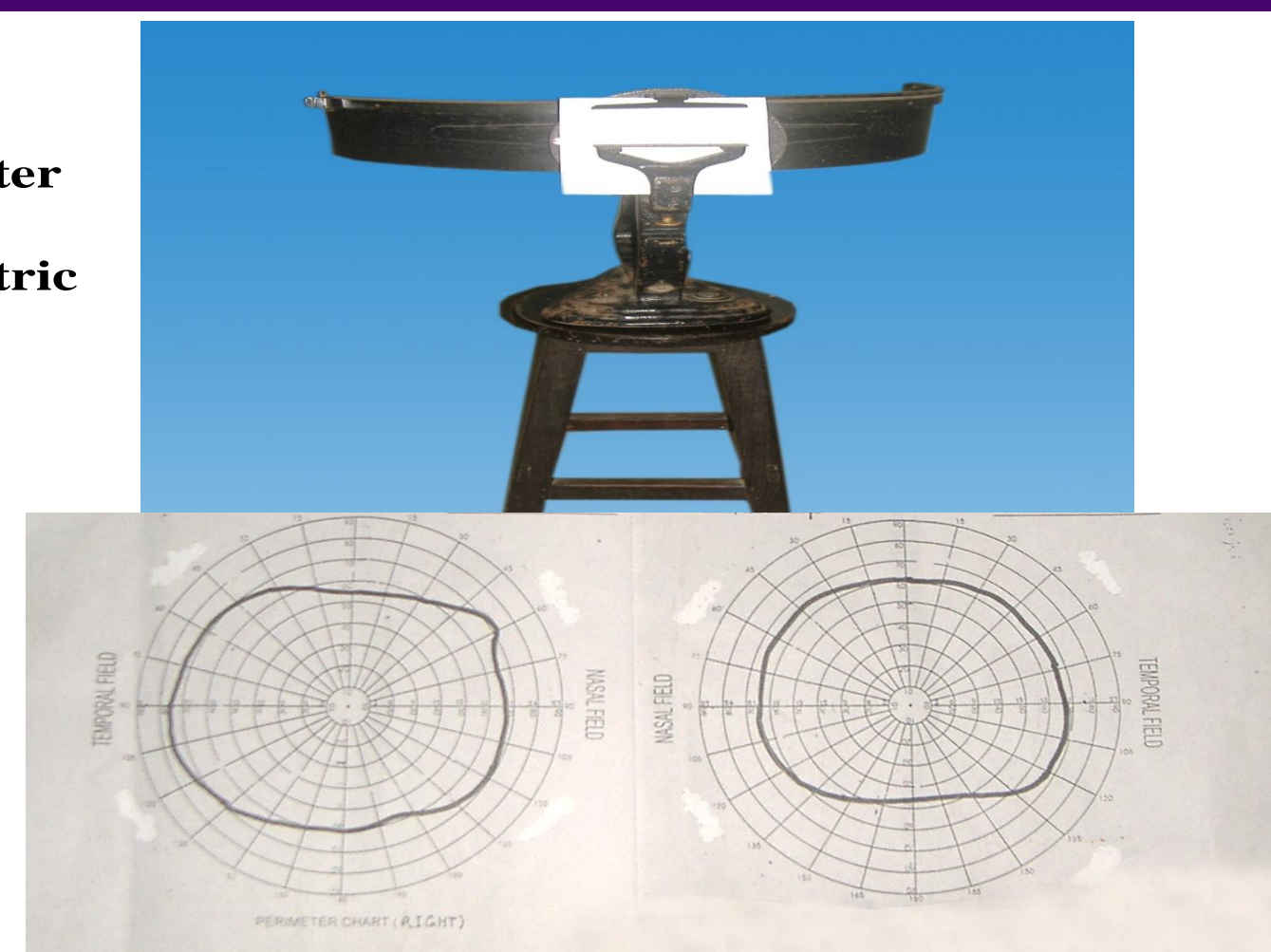
Color Discs



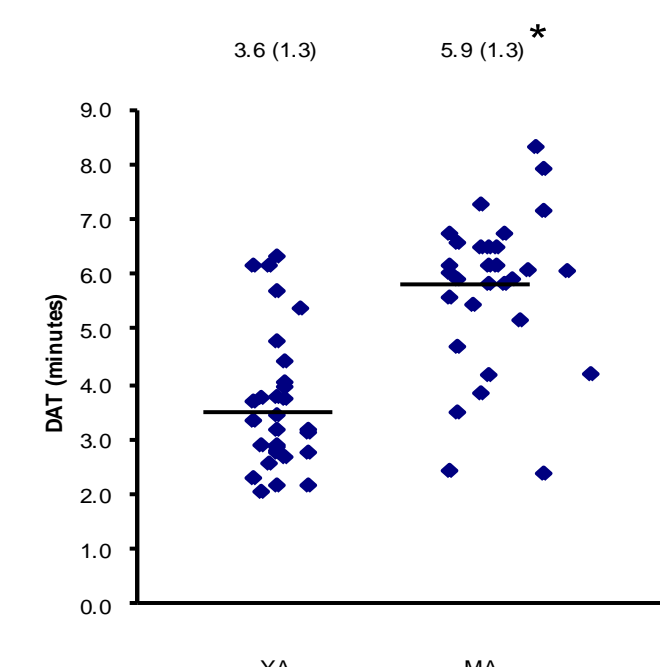
Dark room



Perimeter and Perimetric chart



Relationship between serum retinol level and dark adaptation time (DAT) in young adults (n=30) and middle aged subjects (n=30). Upper trend line is for middle aged subjects and lower one is for young adults. NS: not significant



Values for dark adaptation times in the young adults (YA) (n=30) and the middle-aged subjects (MA)(n=30). Mean values (SD) are shown at the top. Horizontal lines indicate mean values. * indicates $P<0.05$