Old Age and Cancer

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One of the oldest problems of human biology is why man as a species has a maximum span of life of 80–100 years.

During the last fifty years the average duration of life has increased considerably, but this has not been the case in the group of 80 years and older. The question therefore arises whether human life above that age ends from senescence. This is widely believed by the general public and most doctors. Nevertheless it is not self-evident that prolongation of life above this limit is impossible. Anatomical and physiological differences between old and young people are fairly small. Formerly atherosclerosis was considered a normal consequence of old age: “L’homme a l’âge de ses artères”, but we know that it is a disease and many facts about its pathogenesis too, though not yet enough for a rationale of prevention and treatment.

Universal anatomical changes in the elderly are brown atrophy of different tissues and loss of elasticity of elastic fibres. One might wonder if senile emphysema is caused by the latter process only. Probably bacterial invasions of the bronchial tree and repeated attacks of bronchitis are of more importance than senile loss of elasticity. A parallel phenomenon is the loss of elasticity of the arterial wall which begins in the adult and progresses steadily and independently of the degree of atherosclerosis. One may try to define biological age not in pathological but in physiological terms. One of these is the well-known lowering of basal metabolism. Another criterion may be found in the diminution in regenerative power of the skin, manifesting itself in delayed healing of wounds. The nutritional value of plasma for cultures of tissue cells dimin-

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ishes with age. The same holds true for cytolytic activity against tumour cells.

Of these changes none is incompatible with life. This is in accordance with the results of autopsies on elderly people; old people do not die from old age, but from diseases.

In a series of 500 autopsies of patients of sixty years and older, we always found disease to be the cause of death and never old age as such. The diagnosis of senility as a cause of death should either not be used at all, or considered a synonym for cause unknown.

If atherosclerosis were the inevitable consequence of normal wear and tear, it would terminate life if nothing else did. Cancer, however, seems a disease which in principle may be prevented or cured by appropriate treatment. In this line of thinking many a doctor may have felt some doubts if it really is worth while spending millions and millions on combating one disease, if success is inevitably followed by man falling victim to the other – a disease with so long a course and often with such severe disablement. The struggle against cancer however will not result in an increase in the number of elderly people, if there is no revolutionary change in the results of treatment.

At present it seems likely that atherosclerosis may become a preventable disease. Will cancer take its place then as a limiting factor for the span of life? Its frequency, increasing with age, makes this probable. If we relate the number of deaths from cancer to 10,000 living of the same age group, the frequency of cancer increases exponentially with age.

Lachapelle and Chauvergne (*Revue Française de Gériologie* -June 1958) found that in very old age the frequency of some tumours ceases to increase, or even decreases, but ectodermal tumours continue to increase in frequency with age. Malignant disease then appears to be the inevitable accompaniment of old age. If this is true, we must expect cancer as an accidental finding in a proportion of the patients who die from atherosclerosis and other causes. The total frequency of cancer in our series was 155 in 500 autopsies; the frequency of cancer as an accidental finding in cases where the main cause of death was arteriosclerosis was 9 in 314 cases. This is a small number to support the view that the maximum span of life would be determined by cancer if atherosclerosis could be prevented. We should not forget, however, that malignant disease has a long period of incubation but a short period of existence. Compared

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with the 9 cancers found, a far greater number must be in process of developing.

The question, however, whether human life will be limited in future by disease or by an inborn urge to die is still a mystery to us and finds as yet an answer only from poets and philosophers, not from scientists.

References

Lachapelle, A.P. et Chauvergne, J.: *Senescence et cancer* 1958. *Rev.franc.Géront.*, p. 90 (1958).

Gall, T.: *Géront. clin.* 2: 195–209 (1960).

*The Thrombin Generation Test on Plasma**

By Torben Geill, Copenhagen

Clinical Studies on Elderly Patients

The common occurrence of thromboses

in the arterial as well as venous system

during old age has drawn attention to possible disturbances in the clotting mechanism of the blood or in fibrinolytic activity. The important role of the following factors is evident:

Atheromatous changes of the intima

traumatic endothelial damage which presumably attends hypertension

inflammatory vascular changes (arteritis and phlebitis)

and a reduced rate of circulation. On the other hand

it is difficult to determine to what extent the clotting mechanism proper is operative. The reported opinions differ within wide limits

depending upon the methods used for the studies. In previous determinations of the

recalcification time of plasma the author (1956) found a pronounced dispersion of the values among elderly patients compared with the findings in young

healthy subjects. Among the former

however

there was a striking proportion of low values.

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