

Fourthly, of course, the age incidence is unusual. In this group, in my own analysis, the age incidence is as you see. In the 20 to 24 group, 13; in the 25 to 29 group, 14; in the 30 to 34 group, 16; 35 to 39, 1; and then just a handful above 40. This certainly reflects the child-bearing years, but it does not show, to my mind, the steady increase with increasing age one would expect if the strokes were simply a consequence of the hypertension, arteriosclerosis, and so on one would expect in advancing years.

I should point out in this respect, this analysis in a small number of cases does not agree with the British analysis, which found a much higher incidence in the older women. It does, however, agree with the Baltimore study.

Fifth, although the mortality of the patients who had stroke is fairly high, eight of 59, or approximately 15 percent in this group, the survivors seem to make surprisingly good recoveries. Of the 51 in this group, about two-thirds made, as far as we could discover, complete recoveries from their strokes.

Another point of interest that is, I think, deserving of mention is that although stroke involving the cerebral blood vessels and thromboembolism involving the large veins of other parts of the body are the subjects under discussion, another form of arterial disease, coronary artery disease, which certainly is very commonly seen in association with stroke in older people, does not in any of the available studies clearly related or in any way associated with the taking of the birth control drugs.

These differences suggest a search for a different mechanism for the strokes and thromboembolic effects of the pill. I shall not go into this in detail. It is not in my area of competence. You have other witnesses this morning who can speak with much greater significance to this point. It is, however, worth pointing out that this difference may be found in the change in the constituents and the clotting mechanisms of the blood.

It is known that synthetic steroids have a rather dramatic effect on various constituents in the blood and the various factors that are involved in the formation of a clot. So that mechanisms, at least for alterations in the normal clotting behavior, are certainly present.

There is some reason also to believe that there may be changes in the vascular wall itself. It is known that estrogens have an effect on the caliber of veins. In some of the stroke victims who have been studied, there is a peculiar beaded appearance to the walls of the arteries which were apparently involved—not occlusion, but irregularity of outline that suggests there may be edema or other changes in the outer wall of the artery concerned.

Lastly, and rather parenthetically, I should point out to you that a number of other questions are under consideration at the moment. One is the possible significance of the estrogen fraction in the birth control pills. The other is the possible relationship of the development in these thromboses to certain blood types. Some authorities believe that type O patients are singularly immune to such attacks.

I think we might summarize this as follows: the steroid drugs used produce in their recipients a state which, to some degree, resembles pregnancy. Pregnancy is itself known to be accompanied by an in-