

healthy, nonpregnant women. We did have some comparable information comparing incidence in women with that in men.

One well-known paper by Johnson and Walker found a preponderance of males over females of about four to one in the below-40 age group. Another, by Gurdjian, found only seven of both sexes below that age, in a series of 258 cases.

This sort of evidence tells us only something of comparable frequency between males and females and nothing of the actual incidence of spontaneous strokes in young, healthy women. So, knowing neither the expected incidence of such accidents in healthy women not on the drugs nor the actual number of people in a given population who were on the drugs, and being in doubt as to the accuracy of detection, diagnosis and reporting of cases of women who were on the drug, it was impossible to interpret the earlier reports as anything more than a cause for concern.

We were dealing, and I should like to point out that in my opinion, we still are dealing with a sort of fraction. In this fraction, we know with certainty neither the numerator nor the denominator.

Between 1965 and 1968, there was a long series of reports published by investigators who attempted to meet these difficulties. These were of two general classes. Some were studies from what were labeled stroke centers, to which patients with strokes were referred in considerable numbers. Taking this clinical material, it was possible for the investigators to compare the number of cases in young women which had occurred before the time when oral contraceptives were available with the number that occurred after these drugs were available.

Other studies were studies of strokes occurring in the population of large teaching hospitals, again using the numbers of cases and the incidences before and after the pill came to use. In both of these approaches, and especially in the latter, the absolute number of cases was very small. In both, it was impossible to relate the strokes to the relatively small population of women who were known to be taking the drugs.

These reports brought out two things. First of all, they brought out the quite interesting point that in actual fact, strokes in young, healthy women are quite possibly more common than we had realized. They were hampered, of course, by being drawn from centers for the study of such disorders. Their caseload would normally increase with time, and it still could not be easily and accurately determined with relation to the population base.

Their results are conflicting. I cite two: one is a series of 50 cases of proven cerebral vascular accidents in young women relating to the period before and after the availability of the oral contraceptive agents. This study derives from the patients in the Midlands of England. As you can see, there seems to be a clear increase in the number of cases reported after 1963, which was about the time when oral contraceptives began to be used in sizable number in Britain. This series, reported by Bickerstaff, notes that of the 25 patients seen in the center from 1964 to 1966, 18 were taking oral contraceptive drugs.

Interestingly enough, an almost identical population group reported by Jennet, from Glasgow—a very similar sort of population—is reported in the right-hand column. Jennet was impressed by the im-