

We also examined the matched populations to determine whether the difference in prevalence rates could be explained by a systematically greater failure to obtain recommended biopsy specimens from the diaphragm users. The number of cases in each group that should have had biopsy examinations but did not is indicated in Table IX. Biopsy failure were completely random and do not explain the difference in observed prevalence rates between diaphragm users and steroid users.

TABLE IX.—COMPARISON OF NUMBER OF WOMEN IN EACH SUCCESSFULLY MATCHED GROUP WHO HAD CYTOLOGICAL SUSPICION OF CERVICAL CARCINOMA BUT IN WHOM RECOMMENDED BIOPSY SPECIMENS COULD NOT BE OBTAINED

Match ratio. Diaphragm user/Steroid user	Number of women with biopsy specimens not obtained. Diaphragm user/Steroid user
1:1	5:6
1:2	4:7
1:3	2:6

DISCUSSION AND CONCLUSIONS

A study of the prevalence rates of uterine cervical carcinoma in situ among women attending centres of the Planned Parenthood of New York City is reported.

There is a small but significant difference between the population choosing and using the diaphragm and the population choosing and using oral steroids for contraception. It can be attributed either to a decreased prevalence rate for women using a diaphragm or to an increased rate for women using oral steroids. The difference is consistently present in subsets corrected for each of five factors known to influence the prevalence rate of cervical carcinoma: age, ethnic origin, age at first pregnancy (as a reflection of early sexual experience), number of live births, and family income (as a reflection of socio-economic status). When corrections for all five factors are carried out simultaneously there is still a significantly higher prevalence rate for cervical carcinoma in situ within the population choosing and using steroid contraceptives.

The reason for the difference in prevalence rates is not clear. One could postulate some still unknown factor(s) in the makeup, behaviour, or habits of a woman that would alter her probability of developing cervical carcinoma and at the same time impel her to choose a particular contraceptive.

In several different studies a lower rate of cervical carcinoma was found for women who had used barrier contraceptives (diaphragm or condom), compared with women using no contraceptive (Terris and Oalmann, 1960; Boyd and Doll, 1964; Aitken-Swan and Baird, 1965). Though not confirmed by all investigators (Lombard and Potter, 1950; Wynder *et al.*, 1954; Jones *et al.*, 1958; Rotkin and King, 1962), this finding, if true, could well account for the differences we found. Experimental animal studies can be cited to show that human smegma is carcinogenic in susceptible mice (Pratt-Thomas *et al.*, 1956), thus providing a rationale for the concept that barrier contraceptives such as the diaphragm and condom are protective. Also, there is an increased rate of cervical carcinoma in prostitutes (Røjel, 1958), an increased frequency of coitus among women who develop cervical carcinoma (Terris and Oalmann, 1960; Boyd and Doll, 1964), an increased probability of carcinoma in women who first experience coitus at an early age (Rotkin, 1962), and virtually no cervical carcinoma in nuns (Gagnon, 1950).

On the other hand, the cervicovaginal epithelium is a known target organ for steroids, and it is considerably altered by oestrogens and progestogens (Taylor *et al.*, 1967; Koss, 1968). There is experimental evidence that prolonged administration of large doses of oestrogens can cause uterine cervical carcinoma in mice (Allen and Gardner, 1941). The constancy of prevalence rates in Table I does not suggest that we are seeing this kind of direct hormonal effect, but it must be remembered that the data in Table I are not corrected for any of the known factors that affect prevalence rates of this disease. Table I must not be interpreted as giving incidence rate information, since it results from initial examinations only (as is true of all data in this