RISK FACTORS FOR ESTROGEN RECEPTOR POSITIVE AND ESTROGEN RECEPTOR NEGATIVE BREAST CANCER. *BA Rosner, GA Colditz, WY Chen, MD Holmes, and SE Hankinson (Harvard University, Boston, MA)

Risk factors for breast cancer classified according to receptor status have been inconsistent. The authors classified incident cases of breast cancer as either estrogen receptor (ER) positive (both ER and PR positive) or ER negative (both ER and PR negative). During 943,319 p-y of follow-up of 58,520 women in the Nurses' Health Study, there were 1058 cases of ER+/PR+ and 337 cases of ER-/PR-breast cancer, 269 cases were ER+/PR- and 77 cases were ER-/PR+. The log-incidence model of breast cancer was fitted and polytomous logistic regression used to compare coefficients for ER+/PR+ and ER-/PR+ tumors. Incidence of ER+/PR+ tumors increases at 10.8% per year during premenopausal years and at 4.3% per year after natural menopause. In contrast, incidence of ER-/PR- tumors increases at 5.0% per year during premenopausal years and 1.0% after menopause. The adverse effect of first pregnancy persists for ER-/PR-breast cancer (b = 0.021, p = 0.08) but not ER+/PR+ tumors (b = 0.004, p = 0.05). Parity shows a strong inverse association with ER+/PR+ tumors (p = 0.001) but not ER-/PR- tumors (p = 0.84). Duration of use of postmenopausal hormones show similar effects for both tumor types, but current use is somewhat stronger for ER+/PR+ tumors and past use has a strong and significant inverse association with ER+/PR- tumors (p = 0.01), but no association with ER+/PR+ tumors (p = 0.47). Other risk factors show consistent relations with both ER+/PR+ and ER-/PR-breast cancer. Incidence rates for ER+/PR+ and ER-/PR-breast cancer differ by age and menopausal status. The influence of parity and past use of postmenopausal hormones differ between the two tumor types.

ALCOHOL AND THE RISK OF OVARIAN CANCER; RESULTS OF THE NETHERLANDS COHORT STUDY. *J.J. Schouten, R.A. Goldbohm, and P.A. van den Brandt (Maastricht University, Maastricht, The Netherlands, 6200 MD)

Several studies have been conducted to study the relation between alcohol consumption and the risk of ovarian cancer, but the results are inconclusive. In 1986 the Netherlands Cohort Study on Diet and Cancer was initiated. A self-administered questionnaire on dietary habits and other risk factors for cancer was completed by 62,573 women. Follow-up for cancer was established by annual record linkages with the Netherlands Cancer Registry. After 9.3 years of follow-up 214 incident cases of invasive epithelial ovarian cancer and 2211 subcohort members (with complete data on alcohol intake) were available for analysis. In multivariate analysis, the rate ratios (RRs) of ovarian cancer for women who consumed up to 5, 15 and >15 grams per day were 1.07, 0.83 and 0.85 respectively compared to non-drinkers (95% confidence interval (CI) for the top category, 0.52-1.42). The RRs were corrected for age, use of oral contraceptives, parity, height, body mass index, energy intake and current smoking. Multivariate RRs for alcohol consumption from wine up to 5, 15 and >15 grams per day were 1.01, 0.96 and 0.92 respectively compared to non-wine drinkers (CI for the top category, 0.53-1.60). Multivariate RRs for beer and liquor drinking were 0.86 (CI 0.49-1.49) and 0.78 (CI 0.47-1.28), compared to non-beer and non-liquor drinkers, respectively. These data do not suggest an important association between alcohol intake and ovarian cancer risk in this population of premenopausal women.

HYPOTHESIS: TAKING A PAP SMEAR MAY DECREASE THE PREVALENCE OF HPV INFECTION. *S. Shapiro, M. Hoffman, A. Williamson, B. Allan, D. Cooper, H. Carrara, and J. Kelly, L. Rosenberg (Sloan Epidemiology Center, Boston, MA, 02215)

In a case-control study in Cape Town, South Africa, carried out to assess the relation between risk of invasive cervical cancer and use of hormonal contraception, infection with human papilloma virus (HPV) was assessed among 1540 mixed race and black hospital controls. The overall prevalence of high risk HPV was 16%. The prevalence decreased with increasing age, from 25% in women less than 30 years of age to 14% in the oldest women, aged 55-59. HPV infection was rarer among women who had received a Papinicolaou (Pap) smear and decreased with increasing number of smears (12%, 7%, 1%, 0% for women screened 0, 1, 2, and 3 times respectively). HPV infection increased with increasing grade of benign cervical lesion. It also increased with increasing number of sexual partners. In agreement with results in other populations, Pap screening was associated with a reduced risk of cervical cancer despite limitations as carried out in South Africa; relative to never having had a smear, the adjusted relative risk and 95% confidence intervals for 1, 2, and 3 or more Pap smears were 0.7 (0.5, 1.0), 0.5 (0.4, 0.9), and 0.5 (0.3, 0.8) respectively. We hypothesize that the minor trauma associated with taking a Pap smear may trigger an immune response against HPV. The resulting lower HPV prevalence may be a reason for the observed protective effect of Pap screening on cervical cancer risk. As this is the first report of an association of reduced HPV infection with increasing number of Pap smears, these data need cautious interpretation and independent verification.

MAMMOGRAPHIC DENSITY AND THE RISK OF BREAST CANCER IN KOREAN WOMEN. *M-H Shin, B-K Han, S-J Nam, J-H Yang, and C Byrne. (Sungkyunkwan University School of Medicine, Suwon 440-746, Korea)

Increased mammographic density has been consistently associated with the breast cancer risk in Caucasian women. However, data on Asian women are few. To test the association between mammographic density and breast cancer in Korean women, we conducted a case-control study between 1998 and 2002, recruiting incident breast cancers from a teaching hospital in Seoul and non-cancer controls from the same hospital. For the controls, we took a computed radiograph mammogram of the deodor breast. A radiologist measured total and parenchymal area of a breast using the IMAGE software from the National Institutes of Health. The % mammographic density was calculated by dividing parenchymal area by total area. Total of 325 cases and 325 controls were measured. We assessed odds ratios (OR) and their 95% confidence intervals (CI) using logistic regression. Korean women had lower mammographic density than Caucasian women. Women with mammographic density <10% was 18%, 10%~25% was 32%, 25%~50% was 33%, 50%~<75% was 14.5%, and 75% or more was only 2.5% in controls. Compared to the women with density <10%, women with density 75% or more had OR of 3.8 (95% CI = 1.4-10.5, p <0.001). This association was independent of age, body mass index, menarche, and family history. The positive association between mammographic density and breast cancer risk was observed in both pre- and postmenopausal women. The OR for women with density 50% or more compared to the women with density <10% was 5.6 (95% CI = 0.95, 32.6) in postmenopausal women and 3.4 (95% CI = 1.6, 7.3) in premenopausal women.