Large study provides clues to inherited breast cancer

By Keith Mulvihill

PHILADELPHIA, Oct 06 (Reuters Health) - In one of the largest genetic studies of women with breast cancer--in which family members both living and dead were tested--researchers have developed a clearer picture of the link between mutations in the BRCA1 and BRCA2 genes and the risks of developing breast and ovarian cancer.

During the study, the investigators found that women with the breast cancer gene mutation who exercised 3 to 4 hours a week during their teen years actually delayed the onset of the cancer by 6 to 8 years. And they found the risk of developing breast cancer in women who were born after 1940 seems to be higher than those born before 1940, suggesting that some type of environmental factor may be affecting these women.

Overall, the study sheds light the risk of breast and ovarian cancer risk in gene carriers. "There has been a controversy about the risk of breast cancer associated with these mutations. In my opinion, the controversy has been based on researchers having to guess about the status of extended families that were not genetically tested," researcher Dr. Mary-Claire King told Reuters Health.

"And if you have to guess about what a woman's risk is based on family histories alone, you are going to have a lot of error associated with your predicted risk," according to King, of the University of Washington in Seattle. "Our study takes out the guess work."

The large team of researchers from 11 breast cancer centers in New York City evaluated 861 women who had been previously diagnosed with invasive primary breast cancer. A majority of the participants were of Ashkenazi Jewish decent, noted King at a meeting of The American Society of Human Genetics.

The investigators sequenced the breast cancer genes of the women and of all their female relations who were at risk. The researchers were able to analyze all living female family members as well as deceased relatives either by using frozen biopsy materials or by analyzing genetic makeup of their surviving adult children and husbands.

"This meant that we were absolutely sure which women had BRCA1 or BRCA2 gene mutations," King said.

Roughly 10% of the breast cancer patients were found to have at least one of the gene mutations. "Women diagnosed very young, before the age of 35, were far more likely than women diagnosed over the age of 60 to carry mutations in one of these genes," King reported. "Roughly 45% of the women diagnosed before the age of 35 carried a mutation."

King noted that "there is even stronger evidence supporting the fact that a woman's likelihood of carrying one of the gene mutations is high if she has a family history of ovarian cancer."

For a woman with the BRCA1 or BRCA2 mutation, the risk of developing breast cancer was nearly 20% by age 40, 35% at age 50, and 53% by the age of 60.

Gene carriers who had zero to four members from their extended family with breast cancer--groups thought of as "low-risk"--still saw a 36% chance of getting breast cancer by the age of 50, the findings suggest. The risk of ovarian cancer for these same women was also considered to be very high.

"The risks for breast and or ovarian cancer for women who carry the breast cancer mutations is very high over (their) lifetime," King said.