Clinical Pathology Selected Abstracts

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Effectiveness and cost-effectiveness of HPV vaccination based on age

March 2020—U.S. guidelines for human papillomavirus vaccination are 11 to 12 years, with a catch-up vaccination up to age 26 for women and 21 for men. The FDA recently expanded the approved age for HPV vaccination in adult women and men from nine through 45 years. The changes are based on safety data and efficacy as well as potential incremental population-level health benefits. The authors conducted a study to evaluate the added population-level effectiveness and cost-effectiveness of extending the current U.S. HPV vaccination program to women ages 27 through 45 years and men ages 22 through 45 years. They used HPV-ADVISE (agent-based dynamic model for vaccination and screening evaluation), a model for HPV infection and associated diseases specific to U.S. data. The investigators examined four extended HPV vaccination-simulated scenarios—vaccination of women and men up to ages 26, 30, 40, and 45 years—and compared the simulated scenario outcomes with current recommendations. The 9-valent HPV vaccination was used as the intervention in the scenarios. The simulated scenarios showed that the model predicts the current U.S. HPV vaccination program will reduce the number of cases of anogenital warts, cervical intraepithelial neoplasia of grade 2 or 3, cervical cancer, and noncervical HPV-associated cancer by 82, 80, 59, and 39 percent, respectively, over 100 years. It is also a cost-saving measure when compared to no vaccination. However, extending the vaccination to women and men through age 45 years only reduced those outcomes by an additional 0.4, 0.4, 0.2, and 0.2 percentage points, respectively. In addition, the costs associated with extending the vaccination age were substantially higher. The authors concluded that the study showed that the current vaccination program is predicted to save costs. In contrast, extending vaccination to older men and women is predicted to result in only a small additional benefit with substantially higher costs. Future research should include estimating the herd effect from the current U.S. HPV vaccination program and identifying subgroups of older men and women who may benefit from a mid-adult vaccination.

Laprise J-F, Chesson HW, Markowitz LE, et al. Effectiveness and cost-effectiveness of human papillomavirus vaccination through age 45 years in the United States. *Ann Intern Med*. 2020;172:22–29.

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Survival, nonrelapse mortality, and relapse-related mortality after allogeneic hematopoietic cell transplantation

When allogeneic hematopoietic cell transplantation was introduced more than 50 years ago, it was associated with considerable morbidity and mortality. In 2010, the authors published study results that compared outcomes from patients who underwent transplants between 1993 and 1997 against those who underwent transplants between 2003 and 2007. They reported that the rates of nonrelapse mortality (NRM), relapse, and overall mortality had substantially decreased. A decade later, the authors report on improvements in allogeneic transplants gleaned from their study of a cohort that had transplants between 2013 and 2017, which was compared with the cohort that had transplants between 2003 and 2007. Their objective was to determine whether survival improved over the past decade and identify impediments to better outcomes. The authors analyzed survival outcome measures and transplant-related complications in the 2003 to 2007 and 2013 to 2017 cohorts. All patients underwent a conditioning regimen and infusion of donor hematopoietic cells, followed by immunosuppressive drugs and antimicrobial approaches to infection control. The 2003 to 2007 cohort was composed of 1,148 patients and the 2013 to 2017 cohort was made up of 1,131 patients. For the more recent cohort, the authors reported decreases in the adjusted hazards of day-200 nonrelapse mortality, relapse of cancer, relapse-related mortality, and overall mortality. They also reported reductions in the frequency of jaundice, renal insufficiency, mechanical ventilation,

high-level cytomegalovirus viremia, gram-negative bacteremia, invasive mold infection, acute and chronic graft-versus-host disease (GVHD), and prednisone exposure. Reducing the intensity of the conditioning regimens may have contributed to the reduced incidence of acute GVHD as well as less immune suppression and fewer infections. In summary, the authors reported substantial improvements in hematopoietic cell transplant outcomes in patients in the 2013 to 2017 cohort versus the 2003 to 2007 cohort. The data also showed a 34 percent reduction in overall mortality in the 2013 to 2017 cohort compared with the 2003 to 2007 cohort. Relapse rates also declined, although the authors noted that additional gains in survival will depend on future advancements to improve post-transplant relapse or progression of hematologic cancers.

McDonald GB, Sandmaier BM, Mielcarek M, et al. Survival, nonrelapse mortality, and relapse-related mortality after allogeneic hematopoietic cell transplantation: comparing 2003–2007 versus 2013–2017 cohorts. *Ann Intern Med*. doi:10.7326/M19-2936.

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