

Human papillomavirus vaccination and cervical cancer risk

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Abstract

Persistent human papillomavirus infection is the central cause of cervical cancer, the leading cause of cancer death among women worldwide. Clear evidence from both randomized trials and population based studies shows that vaccination against human papillomavirus reduces the incidence of cervical pre-cancer. These data suggest that the vaccine reduces the incidence of cervical cancer. However, human papillomavirus vaccine coverage is inadequate in all countries, especially in low and middle income countries where disease burden is highest. Supply side strategies to improve coverage include increasing the availability of low cost vaccines, school located delivery, single dose vaccine schedules, and development of vaccines that do not need refrigeration. Demand side strategies include enhancing provider recommendations, correcting misinformation, and public awareness campaigns. The near elimination of cervical cancer is achievable through increased uptake of human papillomavirus vaccination and efforts to increase screening for cervical cancer, especially when enacted to reduce disparities in across the world.

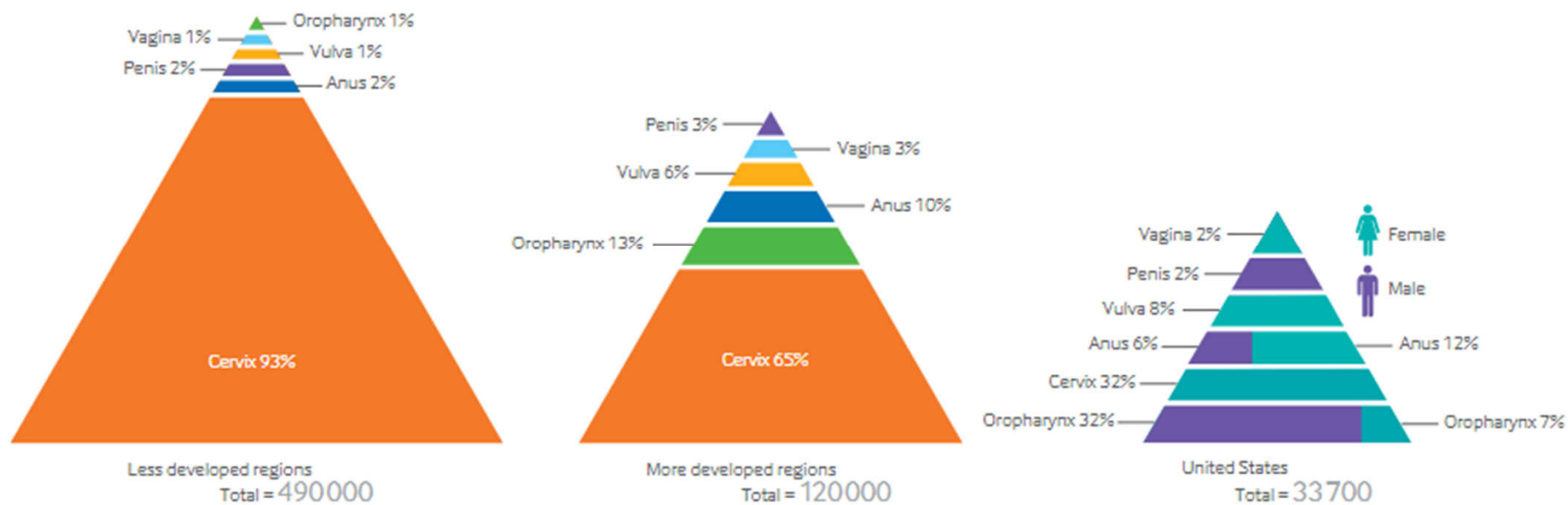



Fig 2 | Numbers of human papillomavirus associated cancers. Adapted from references 21 and 22

PATIENT INVOLVEMENT

A draft of the article was reviewed by a group of cervical cancer survivors and members of the non-profit cervical cancer and awareness group, Cervivor, located in the United States. After giving informed consent, another cervical cancer survivor affiliated with the cancer support network SHARE gave the following perspective: “After many trips to my local health department and misdiagnosis of symptoms which I was told were related to a bacterial infection, I was diagnosed with cervical cancer, which later metastasized. Had the human papillomavirus vaccine been available when I was a teenager, my life would have taken a very different direction. I was not only infected with human papillomavirus once, but with two different types, one of which ultimately led to cancer. I feel as though my socioeconomic situation played a huge role in my largely flying under the radar. Having the option to vaccinate can help people around the world who struggle with access to care not have to navigate treatment of a cancer diagnosis.”






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(incremental CDR, 1.52 per 1000 screenings; 95% CI: 0.74, 2.33; $P < .001$), including invasive CDR (invasive CDR, 1.31 per 1000 screenings; 95% CI: 0.57, 2.06; $P < .001$), and in situ disease (rate of ductal carcinoma in situ, 1.91 per 1000 screenings; 95% CI: 0.10, 3.72; $P < .04$). No differences in PPV1 and PPV3 were identified. The limited number of studies prevented assessment of interval cancer metrics. Excluding MRI, no statistically significant difference in any metrics were identified among the remaining imaging modalities.

Conclusion

The pooled data showed that MRI was the best supplemental imaging modality in women at average risk or intermediate risk for breast cancer with dense breasts and mammography negative for cancer.

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Velina Tzankova MD, Werner J. Becker MD, Tommy L.H. Chan MBBS

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Migraine affects about 12% of adults, with a prevalence of 18% in women and 6% in men.¹⁻³ Globally, in 2019, migraine was the second leading cause of disability among men and women across all age groups, and the leading cause of disability in women aged 15–49 years (expressed as years lived with disability).⁴ In the United States, more than 70% of all migraine-related visits are to primary care providers,⁵ who play a central role in diagnosing and managing migraine. Recently, several new classes of migraine-specific medications have been shown to be effective and the evidence for the effectiveness of non-pharmacologic interventions is growing. In this article, we discuss the diagnosis and acute management of migraine, based on original research evidence, reviews and clinical practice guidelines (Box 1). We discuss prevention of migraine in a second article.⁶

Table 3: New pharmacologic therapies for acute treatment of migraine, with or without aura

Drug	Ubrogepant	Rimegepant*	Lasmiditan†
Mechanism of action	CGRP receptor antagonist	CGRP receptor antagonist	5-HT _{1F} receptor agonist
Dosing	Oral: 50 or 100 mg as needed (max 2 doses/24 h)	Oral or sublingual: 75 mg as needed (max 1 dose/24 h)	Oral; 50, 100 or 200 mg as needed (max 1 dose/24 h)
Adverse effects	Nausea, dizziness and dry mouth	Nausea and abdominal pain and dyspepsia	Dizziness, drowsiness, paresthesia, nausea, vomiting and muscle weakness

Note: CGRP = calcitonin gene-related peptide.

*Rimegepant is not yet approved in Canada.

†Lasmiditan is not expected to be coming to the Canadian market at the present time. Label warning: avoid driving within 8 hours of its use.

Box 2: A clinical approach to managing migraine

- Identify that the primary headache type is migraine.
- Order brain imaging to exclude secondary causes of headache if red flags or abnormalities on physical examination are present.
- Categorize the disorder (episodic v. chronic migraine).
- Identify comorbidities and exacerbating factors.
- Assess disability and attack characteristics.
- Review previous treatments, unmet needs and patient's treatment goals.
- Formulate a treatment plan.
 - Take a stratified approach to acute migraine treatment.
 - Individualized drugs: choose the medication best suited for the patient; with oral prevention drugs, start low and go slow.
 - Consider comorbidities and coverage for migraine prevention (e.g., consider an antidepressant if patient has comorbid psychological symptoms, avoid divalproex acid in people of childbearing age, be aware that calcitonin gene-related peptide monoclonal antibodies (CGRP mAbs) and onabotulinumtoxinA require a trial of at least 2 oral preventatives before they can be covered by public or private funding and that CGRP mAbs are approved for both episodic and chronic migraine, while onabotulinumtoxinA is approved only for chronic migraine).

May 2021, rimegepant was also approved in the US for prevention for episodic migraine, making it the first oral medication with indications for both acute and preventive treatment, the latter being the subject of a subsequent article.^{6,33,35,39}

Key points

- Migraine is a leading cause of disability across all age groups.
- Routine imaging is not recommended in patients with migraine who have no red flags, atypical symptoms or abnormal findings on neurologic examination.
- A stratified approach for acute migraine treatment empowers patients to choose from different treatment options depending on attack symptoms and severity and encourages patients to combine medications from different classes.
- Effective acute migraine treatment includes acetaminophen, nonsteroidal anti-inflammatory drugs and triptans.
- Ubrogepant and rimegepant are new, effective migraine treatments, suitable for patients with cardiovascular disease in whom triptans are contraindicated.

THE END