

Cervical Cancer Prevention: Past, Present and Future

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Oncogenic human papillomavirus (HPV) infection is the most important cause of cervical cancer. Although close to 20 oncogenic HPV types were found, HPV types 16 and 18 account for about 70% of cases of cervical cancer worldwide. The bivalent (Cervarix™, HPV-16/18 AS04-adjuvanted [2vHPV]; GlaxoSmithKline Biologicals) and quadrivalent (Gardasil®, HPV-6/11/16/18 [4vHPV]; Merck & Co., Inc.) HPV vaccines target these two important HPV types. Licensure studies found both vaccines to have excellent efficacy against precursors of cervical cancer, and post-marketing surveillance also reported substantial fall in cervical cancer incidence in many countries. For practical reasons, there has been limited data on the efficacy of these vaccines in preventing the already rare occurrence of genital warts and cervical cancers in teenagers who would be the ideal population for any universal vaccination programme. Despite this, a number of immunobridging studies showed excellent safety and strong immunogenicity of 2vHPV and 4vHPV in adolescence. Therefore, many countries have approved the 2-dose regime of these vaccines in this age group. A recent multi-national randomised clinical trial found superior immunogenicity against HPV-16 and HPV-18 for up to 36 months among teenage girls who received a 2-dose schedule of 2vHPV when compared to 2-dose and 3-dose schedules of 4vHPV. More recently, the marketing of 9-valent HPV vaccine (Gardasil 9 [9vHPV]; Merck and Co., Inc.) covers five more oncogenic HPV types (31, 33, 45, 52, and 58) that account for about 15% of cervical cancers. Phase III efficacy and immunobridging trials confirmed non-inferiority of efficacy and immunogenicity for 9vHPV compared with 4vHPV. In conclusion, the excellent clinical trial and surveillance results of all currently licensed HPV vaccines strongly support their impact as high value public health intervention to prevent anogenital HPV infections and their associated neoplasia. It is also important to emphasise the need for all female vaccinees to undergo cervical cancer screening when they reach young adulthood.