

3. Population impact of Hepatitis A immunization programs

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Question: Should mass hepatitis A vaccination be used in population control of hepatitis A?

Settings: Population

Quality assessment							No of patients		Effect		Quality	Importance
No of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Mass hepatitis A vaccination	Control	Relative (95% CI)	Absolute		
incidence of acute hepatitis A (assessed with: clinical symptoms and laboratory markers of infection)												
14 ¹	observational studies	no serious risk of bias	no serious inconsistency	no serious indirectness	no serious imprecision	none	-	-	NOTE ²	-	⊕⊕⊕ LOW	CRITICAL
							NOTE ⁴			-		
HAV-related mortality (assessed with: death records)												
1 ³	observational studies	no serious risk of bias	no serious inconsistency	no serious indirectness	no serious imprecision	none	-	-	- ³	-	⊕⊕⊕ LOW	CRITICAL
							NOTE ⁴			-		

¹ There were 14 studies that had evidence for population protection using incidence in children and/or adults as an outcome measure. These studies represented the experience of 8 countries. Other outcomes included aggregate cases, vaccine effectiveness, and the prevented fraction (not summarized in this table).

² The overall average incidence of hepatitis A declined in all studies. Most studies found evidence for a reduction in incidence in non-vaccinated age or population groups implying herd immunity.

³ This study compared pre and post HepA-vaccination recommendation cohorts (5 years each) and calculated age-adjusted mortality rates. They found a 32% reduction ($p < 0.001$) in HAV-related mortality in the post-HepA recommendation cohort. They also compared

mortality rates to areas that did not have a HepA-vaccination recommendation and found 45% higher reduction in states with a recommendation compared to those without. The overall reduction in mortality between the two time periods was 23% in non-HepA vaccination recommended areas which pointed to a herd effect.

⁴ Mass immunization programs, number of participants not provided, in some cases number of vaccines delivered provided.

References

Barkai G, Belmaker I, Givon-Lavi N, Dagan R. The effect of universal toddlers-only hepatitis A virus vaccination program on seropositivity rate in unvaccinated toddlers: evidence for reduced virus circulation in the community. *Pediatr Infect Dis J* 2009; 28: 391-3.

Belmaker I, Dukhan L, Yosef Y, Leventhal A, Dagan R. Elimination of hepatitis a infection outbreaks in day care and school settings in southern Israel after introduction of the national universal toddler hepatitis a immunization program. *Pediatr Infect Dis J* 2007; 26:36-40.

Chen YZ, Jiang RJ, Yu WX, Li CH. Study on the effects of controlling hepatitis A epidemics by building the colony immune defence. *Zhonghua Liu Xing Bing Xue Za Zhi*. 3002 24; 366-9.

Cui F, Hadler SC, Zheng H, Wang F, Zhenhua W, Yuansheng H, Gong X, Chen Y, Liang X. Hepatitis A surveillance and vaccine use in China from 1990 through 2007. *J Epidemiol*. 2009;19(4):189-95. Epub 2009 Jun 27.

Dagan R, Leventhal A, Anis E, Slater P, Ashur Y, Shouval D. Incidence of hepatitis A in Israel following universal immunization of toddlers. *JAMA* 2005;294:202-10.

Domínguez A, Oviedo M, Carmona G, Jansá JM, Borrás E, Salleras L, Plasència A. Epidemiology of hepatitis A before and after the introduction of a universal vaccination programme in Catalonia, Spain. *J Viral Hepat*. 2008;15 Suppl 2:51-6.

Domínguez A, Oviedo M, Carmona G, Batalla J, Bruguera M, Salleras L, Plasència A. Impact and effectiveness of a mass hepatitis A vaccination programme of preadolescents seven years after introduction. *Vaccine*. 2008a; 26:1737-41.

Fisenka EG, Germanovich FA, Glinskaya IN, Lyabis OI, Rasuli AM. Effectiveness of universal hepatitis A immunization of children in Minsk City, Belarus: four-year follow-up. *J Viral Hepat*. 2008;15 Suppl 2:57-61.

Hanna JN, Hills SL, Humphreys JL. Impact of hepatitis A vaccination of indigenous children on notifications of hepatitis A in north Queensland. *Med J Aust* 2004; 181: 482-485

Lopalco PL, Prato R, Chironna M, Germinario C, Quarto M. Control of hepatitis by universal vaccination of adolescents, Puglia, Italy. *Emerg Infect Dis* 2008; 14: 526-8.

Tsou TP, Liu CC, Huang JJ, Tsai KJ, Chang HF. Change in hepatitis A epidemiology after vaccinating high risk children in Taiwan, 1995-2008. *Vaccine* 2011; 29:2956-61.

Vogt TM, Wise ME, Bell BP, Finelli L. Declining hepatitis A mortality in the United States during the era of hepatitis A vaccination. *J Infect Dis* 2008; 197:1282-8.

Wasley A, Samandari T, Bell BP Incidence of hepatitis A in the United States in the era of vaccination. *JAMA* 2005; 294:194-201.

Zhang ZL, Zhu XJ, Ding YX, Xie XH, Gao ZG, Li YC, Zhang Y, Xia WD, Liu Y. Evaluation on the role of hepatitis A vaccine in the prevention and control of hepatitis A in Tianjin city. *Zhonghua Liu Xing Bing Xue Za Zhi*. 2007; 28:1000-3.

Zhuang FC, Qian W, Mao ZA, Gong YP, Jiang Q, Jiang LM, Chen NL, Chai SA, Mao JS. Persistent efficacy of live attenuated hepatitis A vaccine (H2-strain) after a mass vaccination program. *Chin Med J (Engl)*. 2005; 118:1851-6.