



Smallpox Bibliography August 2004

1: Am J Infect Control. 2004 May;32(3):126-30.

Frequency of vaccinia virus isolation on semipermeable versus nonocclusive dressings covering smallpox vaccination sites in hospital personnel.

Hepburn MJ, Dooley DP, Murray CK, Hospenthal DR, Hill BL, Nauschuetz WN, Davis KA, Crouch HK, McAllister CK.

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BACKGROUND: The Centers for Disease Control and Prevention recommends a semipermeable occlusive dressing for hospital workers who receive smallpox vaccination. **OBJECTIVE:** The study was designed to determine the frequency of vaccinia virus isolation from the outer surface of semipermeable dressings and to compare the prevalence of vaccinia virus on the outer surface of semipermeable dressings with its prevalence on the outer surface of nonocclusive dressings. **METHODS:** A prospective, observational study was conducted on hospital employees who received smallpox vaccination at a military academic medical center. Subjects were instructed to wear a semipermeable dressing if they had direct patient contact. Employees without direct patient care had the option of wearing a semipermeable dressing or a nonocclusive dressing. Prior to a programmed dressing change, the outer surface of the bandage site was swabbed and cultured for virus. Samples were considered positive when cytopathic effects were observed, with results confirmed as vaccinia by polymerase chain reaction. **RESULTS:** A total of 212 cultures were obtained from 93 subjects. All cultures directly obtained from active lesions were positive (13/13). Positive cultures were obtained from 7% (10/135) of the semipermeable dressings and 23% (15/64) of the nonocclusive dressings ($P < .05$). Ten percent (8/79) of the semipermeable dressings with purulent exudate observed underneath the bandage were culture positive, compared with 4% (2/56) of semipermeable dressings with no purulent exudate observed underneath the bandage ($P = .19$). **CONCLUSIONS:** Compared with nonocclusive dressings, the semipermeable dressing reduced, but did not eliminate, the frequency with which vaccinia virus was cultured from the surface of the dressing. Virus was present, but only rarely, on the dressing surface in the absence of purulent exudate under the semipermeable dressings.

PMID: 15153922 [PubMed - indexed for MEDLINE]

2: Am J Nurs. 2004 Jul;104(7):104.

Smallpox vaccination update.

Peterson C.

Department of Nursing Practice and Policy at the American Nurses Association, USA.

PMID: 15243271 [PubMed - indexed for MEDLINE]

3: Am J Public Health. 2004 Jun;94(6):943-7.

Uncertain benefit: the public policy of approving smallpox vaccine research.

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Without an accurate assessment of the prospect of bioterrorist attack, it is especially challenging to evaluate the protocols for testing smallpox vaccines in the pediatric population. Usual regulatory mechanisms cannot shepherd research protocols with benefits that can only be characterized as "uncertain" in the face of more than minimal risk. When a protocol is placed in a government forum for analysis, the public has a unique opportunity to debate the balancing of research risks and benefits on behalf of children who are unable to assent to research themselves, as well as to express views about vaccination policy broadly. This model for review of pediatric research that may be without benefit will be especially important as challenging studies of various vaccines against a range of infectious properties, such as anthrax and severe acute respiratory syndrome (SARS), emerge.

PMID: 15249295 [PubMed - indexed for MEDLINE]

4: Bull Hist Med. 2004 Summer;78(2):349-78.

Between persuasion and compulsion: Smallpox control in Brooklyn and New York, 1894-1902.

Colgrove J.

Two major outbreaks of smallpox occurred in Brooklyn and New York around the turn of the twentieth century. Health officials moved aggressively to contain the disease, conducting mass vaccinations from house to house and in workplaces. Although these programs were ostensibly voluntary, the manner in which they were conducted was often coercive, giving many people the impression they had no choice but to submit. Officials portrayed their programs as voluntary because

they lacked a clear legal basis for their actions and because they believed this was the most effective strategy for gaining public cooperation. This essay examines the events that surrounded a series of legal cases challenging the use of coercive measures to enforce vaccination during and after the smallpox epidemic of 1894, and the repercussions that this litigation had on disease-control efforts and popular attitudes toward vaccination and other measures. The cases described here were part of an extensive body of nineteenth-century jurisprudence on vaccination that was crucial for the evolution of public health police powers in general, and of vaccination policy in particular.

Publication Types:
Historical Article
Legal Cases

PMID: 15211052 [PubMed - indexed for MEDLINE]

5: Creighton Law Rev. 2003 Apr;36(3):359-74.

Terror and triage: prioritizing access to mass smallpox vaccination.

Silverman RD, May T.

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In response to the threat of a smallpox attack on the United States, the Centers for Disease Control and Prevention ("CDC") recommended the establishment of smallpox clinics designed to distribute a vaccine to the entire U.S. population in a ten day period. However, a number of potential obstacles raise questions about the feasibility of this plan. What is needed is a plan that applies principles of triage to smallpox vaccine distribution following a bioterrorism attack. Only in this way can those most vulnerable--the previously unvaccinated--be protected from a significantly increased risk due to delays that might arise in executing the CDC plan.

PMID: 15199933 [PubMed - indexed for MEDLINE]

6: Epidemiology. 2004 May;15(3):264-70.

Comment in:
Epidemiology. 2004 May;15(3):258-60; discussion 260-1.

Preventing second-generation infections in a smallpox bioterror attack.

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This article presents a new probabilistic model for the prevention of second-generation infections by different vaccination strategies in the event of a smallpox bioterror attack. The main results are independent of the

reproductive number R_0 (the number of secondary infections transmitted per index infected individual) and population mixing patterns. General expressions are derived for the fraction of second-generation infections that can be prevented through vaccination, whereas specific results are obtained for traced and mass vaccination, respectively. Expressions for total outbreak size in controlled epidemics are also presented. The analysis highlights the importance of vaccination logistics in addition to beliefs and assumptions regarding smallpox epidemiology in evaluating alternative responses to a smallpox bioterror attack.

Publication Types:

Review
Review, Tutorial

PMID: 15097005 [PubMed - indexed for MEDLINE]

7: *Epidemiology*. 2004 May;15(3):258-60; discussion 260-1.

Comment on:

Epidemiology. 2004 May;15(3):264-70.

Smallpox: a vulnerable specter.

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Publication Types:

Comment
Review
Review, Tutorial

PMID: 15097002 [PubMed - indexed for MEDLINE]

8: *Infect Dis Clin North Am*. 2004 Mar;18(1):79-100.

Smallpox and measles: historical aspects and clinical differentiation.

Cunha BA.

Smallpox and measles have ravaged native populations worldwide for centuries. Millions of people have succumbed to smallpox or measles or suffered from their effects. Clinicians wonder how their predecessors confused measles with smallpox. The difficulty was in differentiating smallpox and measles in their early phases, which had important public health implications. The prodromal rash of smallpox sometimes resembled measles. Clinicians through the ages learned to differentiate smallpox and measles in their early stages. Osler's careful clinical description of prodromal smallpox is a classic in infectious diseases. Koplik's appreciation of the diagnostic significance of the spots on the buccal mucosa was another advance in the early diagnosis of measles. The clinical features and effects of measles and smallpox on history are reviewed.

Publication Types:
Historical Article

PMID: 15081506 [PubMed - indexed for MEDLINE]

9: Int J Health Serv. 2004;34(1):173-5.

With demand lacking, smallpox vaccine expiring.

Smith S.

Boston Globe, USA.

The Bush administration's campaign to vaccinate health care workers against smallpox has proved unpopular, largely because of concerns about the safety of the vaccine and who would pay for any needed medical treatment. State health departments have destroyed about 61,000 doses of expired vaccine--substantially more than the number actually administered.

PMID: 15088681 [PubMed - indexed for MEDLINE]

10: J Virol. 2004 Jul;78(13):7052-60.

Protection against lethal vaccinia virus challenge in HLA-A2 transgenic mice by immunization with a single CD8+ T-cell peptide epitope of vaccinia and variola viruses.

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CD8(+) T lymphocytes have been shown to be involved in controlling poxvirus infection, but no protective cytotoxic T-lymphocyte (CTL) epitopes are defined for variola virus, the causative agent of smallpox, or for vaccinia virus. Of several peptides in vaccinia virus predicted to bind HLA-A2.1, three, VETFsm(498-506), A26L(6-14), and HRP2(74-82), were found to bind HLA-A2.1. Splenocytes from HLA-A2.1 transgenic mice immunized with vaccinia virus responded only to HRP2(74-82) at 1 week and to all three epitopes by ex vivo enzyme-linked immunosorbent spot (ELISPOT) assay at 4 weeks postimmunization. To

determine if these epitopes could elicit a protective CD8(+) T-cell response, we challenged peptide-immunized HLA-A2.1 transgenic mice intranasally with a lethal dose of the WR strain of vaccinia virus. HRP2(74-82) peptide-immunized mice recovered from infection, while naive mice died. Depletion of CD8(+) T cells eliminated protection. Protection of HHD-2 mice, lacking mouse class I major histocompatibility complex molecules, implicates CTLs restricted by human HLA-A2.1 as mediators of protection. These results suggest that HRP2(74-82), which is shared between vaccinia and variola viruses, may be a CD8(+) T-cell epitope of vaccinia virus that will provide cross-protection against smallpox in HLA-A2.1-positive individuals, representing almost half the population.

PMID: 15194781 [PubMed - indexed for MEDLINE]

11: *Pediatr Blood Cancer*. 2004 Jul;43(1):4-7.

Smallpox vaccination recommendations for contacts of pediatric cancer patients.

Sung L, Schwartz B, Abramson J, Greenberg DP, Edwards K, Feusner J, Allen U, Ritchey AK.

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PMID: 15170883 [PubMed - indexed for MEDLINE]

12: *Proc Natl Acad Sci U S A*. 2004 Mar 30;101(13):4590-5. Epub 2004 Mar 11.

Highly attenuated smallpox vaccine protects mice with and without immune deficiencies against pathogenic vaccinia virus challenge.

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Modified vaccinia virus Ankara (MVA), developed >30 years ago as a highly attenuated candidate smallpox vaccine, was recloned from a 1974 passage and evaluated for safety and immunogenicity. Replication of MVA is impaired in most mammalian cells, and we found that mice with severe combined immunodeficiency disease remained healthy when inoculated with MVA at 1,000 times the lethal dose of vaccinia virus derived from the licensed Dryvax vaccine seed. In BALB/c mice inoculated intramuscularly with MVA, virus-specific CD8+ T cells and antibodies to purified virions and membrane protein components of the intracellular and extracellular infectious forms of vaccinia virus were induced in a dose-dependent manner. After one or two inoculations of MVA, the T cell numbers and antibody titers equaled or exceeded those induced by percutaneous injection of Dryvax. Antibodies induced by MVA and Dryvax were neutralizing and inhibited virus spread in cultured cells. Furthermore, vaccinated mice were protected against lethal intranasal challenge with a pathogenic vaccinia virus. B cell-deficient mice unable to generate antibodies and beta2-microglobulin-deficient mice unable to express MHC class I molecules for a CD8+ T cell response were also protectively vaccinated by MVA. In contrast, mice with decreased CD4 or MHC class II expression and double-knockout mice deficient in MHC class I- and II-restricted activities were poorly protected or unprotected. This study confirmed the safety of MVA and demonstrated that the overlapping immune responses protected normal and partially immune-deficient animals, an encouraging result for this candidate attenuated smallpox vaccine.

PMID: 15070762 [PubMed - indexed for MEDLINE]