

“grieving” and miss out on appropriate and effective treatment for a depressive disorder.

Other family members may also need psychological support. The woman’s partner may experience similar feelings of loss.<sup>16</sup> In such situations, the father is often neglected (“men aren’t expected to talk about their feelings”). He will also benefit from an opportunity to talk about his feelings of loss, as will other children in the family, especially as they may feel responsible if they had feelings of jealousy about the new sibling.

The sense of loss may dissipate when the woman becomes pregnant again, and some studies suggest that the shorter the time between a pregnancy loss and a subsequent pregnancy the better the outcome for the woman.<sup>13</sup> Such women usually feel anxious during the stage of pregnancy at which the previous loss occurred. Finally, women may benefit from the opportunity to talk to other women who have experienced a pregnancy loss through support groups such as SANDS <<http://www.sands.org.au/>>.

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1. Regan L, Rai R. Epidemiology and the medical causes of miscarriage. *Best Pract Res Clin Obstet Gynaecol* 2000; 14: 839-854.
2. Frost M, Condon JT. The psychological sequelae of miscarriage: a critical review of the literature. *Aust N Z J Psychiatry* 1996; 30: 54-62.
3. Condon JT. Pregnancy loss. In: Steiner M, Yonkers K, Eriksson E, editors. *Mood disorders in women*. London: Martin Dunitz, 1998: 353-369.
4. Janssen HJ, Cuisinier MC, Hoogduin KA, de Graauw KP. Controlled prospective study on the mental health of women following pregnancy loss. *Am J Psychiatry* 1996; 153: 226-230.
5. Neugebauer R, Kline J, Shrout P, et al. Major depressive disorder in the 6 months after miscarriage. *JAMA* 1997; 277: 383-388.
6. Friedman T, Gath D. The psychiatric consequences of spontaneous abortion. *Br J Psychiatry* 1989; 155: 810-813.
7. Slade P. Predicting the psychological impact of miscarriage. *J Reprod Infant Psychol* 1994; 12: 5-16.
8. Geller PA, Klier CM, Neugebauer R. Anxiety disorders following miscarriage. *J Clin Psychiatry* 2001; 62: 432-438.
9. Engelhard IM, van den Hout MA, Arntz A. Posttraumatic stress disorder after pregnancy loss. *Gen Hosp Psychiatry* 2001; 23: 62-66.
10. Niksevic AV, Kuczmierczyk AR, Tunkel S, Nicolaidis K. Distress after miscarriage: Relation to the knowledge of the cause of pregnancy loss and coping style. *J Reprod Infant Psychol* 2000; 18: 339-343.
11. Lee C, Slade P, Lygo V. The influence of psychological debriefing on emotional adaptation in women following early miscarriage: A preliminary study. *Br J Med Psychol* 1996; 69: 47-58.
12. Brier N. Understanding and managing the emotional reactions to a miscarriage. *Obstet Gynaecol* 1999; 93: 151-155.
13. Franche RL. Psychologic and obstetric predictors of couples' grief during pregnancy after miscarriage or perinatal death. *Obstet Gynaecol* 2001; 97: 597-602.
14. Beutel M, Deckardt R, von Rad MWH. Grief and depression after miscarriage: their separation, antecedents, and course. *Psychosom Med* 1995; 57: 517-526.
15. Gareil M, Blondel B, Lelong N, et al. Long-term consequences of miscarriage: The depressive disorders and the following pregnancy. *J Reprod Infant Psychol* 1994; 12: 233-240.
16. Conway K, Russell G. Couples' grief and experience of support in the aftermath of miscarriage. *Br J Med Psychol* 2000; 73: 531-545. □

## Bioterrorism in Australia

### *How real is the threat, and how prepared are we?*

THE WORLD CHANGED on September 11, 2001, and again on October 4, when the first case of inhalational anthrax in the United States raised worldwide fears of bioterrorism. Although the threat of bioterrorism in Australia has been assessed as low,<sup>1</sup> defence and civil authorities had upgraded preparations before the 2000 Olympics.<sup>2</sup> Those plans, coordinated by Emergency Management Australia, provided a basis for responses by state emergency services, health services and postal services to the numerous false alarms, “white powder” incidents and hoaxes that followed the US events. No anthrax spores or human anthrax cases associated with these incidents have been detected in Australia, but understandably they have caused considerable public anxiety. In retrospect, it now appears that the anthrax-containing letters in the US were probably of domestic origin, with no targets outside that country.<sup>3</sup>

After the US incidents, health departments were swamped with calls from the public asking what had been done to protect them. They wanted to know how to protect themselves, and whether they needed antibiotics, vaccines

for anthrax or smallpox, or gas masks. Health authorities emphasised communication to reassure those who were worried, as well as to provide authoritative information and planning advice about anthrax and other conceivable threats. Should a biological incident ever occur in Australia, communication would be even more important, not only in managing the emergency, but also in minimising community alarm, which could cause more damage than the biological agent itself. In any incident, healthcare agencies would play a key role in recognising resulting illnesses and managing the health consequences.

The anthrax threat has highlighted the importance of multidisciplinary approaches to biological emergencies. Security intelligence must be wedded to health intelligence, and the lessons learned from past disaster management appropriately applied. As an editorial in the *Lancet* recently said, “Appropriate reaction to such deliberate attacks, but also to any other emerging epidemic, by a well-organised and well-functioning public health system requires preparedness at all times on all levels”.<sup>4</sup> Australia’s federal system

requires close collaboration between the Commonwealth, States and Territories. Emergency service responses are coordinated by Emergency Management Australia. Public health agencies work with emergency services in the States and collaborate through the Communicable Diseases Network Australia and the Public Health Laboratory Network to coordinate national reporting, surveillance, laboratory diagnosis and public health responses for communicable disease outbreaks. Biosecurity planning in Australia has built on these existing disease and disaster surveillance systems.<sup>2</sup>

Recently, these networks have collaborated to revise training schedules and case definitions to support the earliest possible recognition of any event resulting from deliberate release of a biological agent. Health authorities, through the Communicable Diseases and Public Health Laboratory networks and the network of Chief Health Officers of the States, have also strengthened their linkages with Emergency Management Australia, the federal department of Defence and other government agencies.

**Anthrax:** The review of Australia's policies has adapted advice from the US Centers for Disease Control and Prevention (CDC), World Health Organization (WHO) and United Kingdom Public Health Laboratory Service for local needs. Guidelines for anthrax treatment and post-exposure prophylaxis have been developed by public health physicians, microbiologists and infectious disease specialists, and endorsed by Australia's Chief Health Officers and directors of public health services.

It has been agreed that primary care providers should not prescribe chemoprophylaxis in the event of suspected anthrax. Instead, they should immediately contact their local public health unit for advice about referral for diagnosis and further management (contact details for State and Territory health authorities are available on *Fact sheet — anthrax* <[http://www.health.gov.au/pubhlth/strateg/communic/factsheets/anthrax\\_fact.htm](http://www.health.gov.au/pubhlth/strateg/communic/factsheets/anthrax_fact.htm)>). To minimise inappropriate antibiotic use, general practitioners should not provide individuals with a contingency supply of antibiotics for prophylaxis.

State and Territory health authorities are ensuring that there are adequate supplies of appropriate antibiotics in case of an emergency, and the Commonwealth Government is working with pharmaceutical companies to ensure continuity of supply. Anthrax vaccine is not currently registered for use in Australia and is not recommended as a first-line response to an anthrax incident.

**Smallpox:** The US government's intention to procure 250–300 million doses of smallpox vaccine for mass vaccination appears to have been modified after expert advice. Existing vaccine is effective but has significant adverse effects. The calf-lymph-derived live smallpox vaccine used in the WHO smallpox eradication program is associated with a post-vaccinal encephalitis rate of 3–4 per million primary vaccine doses.<sup>5</sup> Forty per cent of encephalitis cases are fatal, and some survivors have permanent neurological deficits. Progressive vaccinia occurs among those who are immunocompromised. WHO guidance is that, given the substantial

risk of adverse events after vaccination, mass vaccination of populations is not recommended when there is little or no real risk of exposure.

Despite the stated intention of the US to develop a new vaccine supply against a possible bioterrorism incident, no country is planning to give smallpox vaccine routinely to its citizens. Smallpox is not transmissible until the onset of rash, when the individual becomes ill and is likely to be confined to bed. This provides the rationale for measures to contain any outbreak: after the first cases are identified and isolated, contacts are vaccinated; vaccination prevents or ameliorates disease, even when it is undertaken after exposure to the virus.<sup>5</sup> Thus, both WHO and CDC recommend an approach which involves early case detection and post-exposure vaccination with a view to "ring fencing" any outbreak.<sup>5-7</sup>

Australia has no smallpox vaccine available at present. As a precautionary measure, the Commonwealth Government has arranged with international agencies to secure access to vaccine in the unlikely event of a smallpox incident; arrangements have also been made to secure supplies of vaccine to be held in Australia. If smallpox were introduced into Australia, we would then be in a position to implement a strategy of surveillance, quarantine and vaccination. WHO has pledged support to any country in which an incident occurs, as this would constitute an international emergency. WHO will help countries pool resources to contain any outbreak as rapidly as possible.

**Conclusions:** Although the risk to Australia is regarded as low, we need to be prepared for a bioterrorism incident. Australia's strong public health infrastructure forms the basis for an effective response to any such incident. While much of the initial planning has focused on anthrax and smallpox, progress has been made on public health and clinical protocols for other potential bioterrorism agents. No public health or security system can guarantee complete safety from bioterrorism attack, but Australia's public health expertise will ensure that harm to the community is minimised.

For the assistance of doctors, a comprehensive guide for dealing with patient inquiries is available on the website of the Commonwealth Department of Health and Ageing (<<http://www.health.gov.au/pubhlth/strateg/bio/index.htm>>). This also contains a list of contacts for public health authorities around Australia. Relevant information can also be accessed through the WHO and CDC sites (<[http://www.who.int/emc/deliberate\\_epi.html](http://www.who.int/emc/deliberate_epi.html)> and <<http://www.cdc.gov>>, respectively).

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1. Robertson AG. Bioterrorism — an Australian perspective. *ADF Health* 2000; 1: 99-106.
2. Emergency Management Australia. Health aspects of chemical and radiological hazards. Provisional ed. Australian emergency manuals series. Manual 3, Vol 2, Part 3. Canberra: EMA, 2000.
3. MacKenzie D. Home truths. Did the anthrax attacker get their supplies from a military lab? *New Scientist* 2001; Dec 22/29: 5.
4. Bioterrorism: safeguarding the public's health [editorial]. *Lancet* 2001; 358: 1283.
5. Henderson DA. Smallpox. Clinical and epidemiologic features. *Emerg Infect Dis* 1999; 5: 537-539.
6. Statement to the press by the Director General of the World Health Organization, Dr Gro Harlem Brundtland — World Health Organization announces updated guidance on smallpox vaccination. Statement WHO/16, 2 Oct 2001. Available at <<http://www.who.int/inf-pr-2001/en/state2001-16.html>> Accessed Feb 2002.
7. Centers for Disease Control and Prevention. Interim smallpox response plan and guidelines, 26 November 2001. Available at <<http://www.cdc.gov/nip/smallpox/>> Accessed Feb 2002. □

## Guiding antenatal care

### *Current practices should be re-examined in light of current evidence*

ANTENATAL CARE includes screening asymptomatic pregnant women, with the aim of detecting, and thereby preventing, both maternal and neonatal adverse events. The introduction of antenatal care in 1913 has been widely attributed to the efforts of Ballantyne at the University of Edinburgh. He suggested that the high maternal and perinatal mortality rates observed at the beginning of the 20th century reflected inadequate maternity care during pregnancy and lack of supervision of the progress of labour. Ballantyne's flow diagram, an antecedent of guidelines, defined interactions of many disciplines in antenatal care.

During the 1930s, there was increased emphasis on educating healthcare professionals who provided maternity care. Women were encouraged to present during pregnancy, and were advised to give birth in hospital. The subsequent fall in perinatal mortality rates was attributed to antenatal care, without consideration of the contribution from social and other medical improvements.<sup>1</sup> The falling mortality rates corresponded with a gradual increase in the number of antenatal visits recommended. By the 1950s, a schedule of monthly visits to 28 weeks, fortnightly visits to 36 weeks, and then weekly visits until birth had become standard.<sup>1</sup> Although programs with fewer visits have been proposed, this schedule is widely accepted in clinical practice. This has remained largely unchallenged, as noted by Archie Cochrane, who stated "by some curious chance, antenatal care has escaped the critical assessment to which most screening procedures have been subjected".<sup>2</sup>

Traditional antenatal care was critically appraised in a retrospective review of 1907 pregnant women who gave birth at the Aberdeen Maternity Hospital in 1975.<sup>1</sup> Antenatal and birth records were reviewed to determine the rates at which complications were diagnosed, misdiagnosed and overdiagnosed, in addition to the rate at which complications occurred despite routine antenatal care. Breech presentation and pre-eclampsia were the only complications reliably detected in the antenatal period, and the benefit in the detection of pre-eclampsia was confined to primigravid women beyond 34 weeks' gestation. Most antenatal admissions, apart from admissions for labour and birth, were for conditions that had arisen despite routine

antenatal care — conditions that had not been prevented or detected by it.

More recently, randomised controlled trials have assessed the optimal frequency of antenatal visits in preventing maternal and fetal complications. The main hypothesis tested in these trials is that models of care with fewer antenatal visits are as effective as the traditional model in terms of clinical outcomes and maternal satisfaction.<sup>3</sup> A systematic review of seven randomised controlled trials involving 57 418 women found no differences in the detection of pre-eclampsia (odds ratio [OR], 0.91; 95% CI, 0.66–1.26), urinary tract infection (OR, 0.93; 95% CI, 0.79–1.10), low birthweight (OR, 1.04; 95% CI, 0.93–1.17) or maternal mortality (OR, 0.91; 95% CI, 0.55–1.51) when a schedule of reduced antenatal visits was compared with more traditional regimens of antenatal visits.<sup>4</sup> However, women were more dissatisfied with fewer visits. Whether increased maternal satisfaction is of measurable benefit in terms of pregnancy and birth outcomes remains less certain.

Clinical practice guidelines should define best practice, limit variations in the provision of care, recommend care that is cost-effective, and provide care in a way that meets the needs of all patients. In this issue of the *Journal* (page 255), Hunt and Lumley have reviewed guidelines used in Australian maternity units. They found that recommendations for the content of antenatal visits and screening procedures vary considerably across Australia. The value of certain tests or interventions can be readily appreciated in terms of a low cost treatment capable of disease modification (eg, provision of anti-D to rhesus-negative women); however, evidence of benefit is lacking in other circumstances (eg, routine screening for carbohydrate intolerance), although current clinical trials will address some of these issues. Routine antenatal screening for syphilis, although low cost and with effective therapy available for patients testing positive, could be questioned given the low prevalence of the disease among pregnant white Australians. However, selective testing and treatment has not been supported.<sup>6</sup>

Hunt and Lumley also demonstrate the other end of the clinical spectrum, where good-quality evidence exists to support a treatment or policy but institutions have no