the urban and rural populations predominantly in children less than three years of age. Symptoms caused by the protozoa include nausea, vomiting and a watery diarrhoea with cramping abdominal pains occurring for one to two weeks but possibly lasting for up to four weeks.

The treatment is non-specific and symptomatic i.e. avoiding dehydration. There is no specific drug treatment against this parasite.

Cryptosporidium is found in a number of wild and domestic animals including man. Person to person and water borne spread are thought to be common methods of transmission of this parasite. The incubation period is four to twelve days. Diagnosis in Alice Springs is established by the demonstration of oocysts in the faeces using a modified acid fast stain. The parasite appears as a red oval or crescentic shaped organism four to six microns in diameter.

The Alice Springs Disease Control Centre response to the information received from the laboratory was to alert the community in two ways.

1. Contact the child minding establishments reminding them of basic hygiene and to isolate children with diarrhoea.
2. Contact the doctors and nurses and health workers in the urban and rural areas via fax, of the presence of the disease.

Cryptosporidium belongs to the coccidial protozoa. Others in the group that cause disease in humans are:

a) *Isospora belli*, a large acid fast elliptical parasite 23 to 33 microns diameter containing one to two sporoblasts.

b) *Microsporidia*, a small parasite one to two microns in diameter seen using a modified trichrome stain.

c) *Cyclospora*, eight to ten microns in diameter seen with a modified acid fast stain.

The latter organism has been recently identified as a cause of traveller's diarrhoea.

References
2. J Hanna, D Brookes, L Burns - Cryptosporidiosis in a child day care centre. CDV Vol 19 No 1 6-8 9 January 1995

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Editorial

*Cryptosporidium parvum* is the second most common parasite found in the Central Australian area. Over a five year period between July 1989 and June 1994 a total of 22,446 faeces were submitted to the Alice Springs Hospital laboratory. Most of the patients had multiple specimens submitted as the normal protocol is to submit three specimens for initial examination and then follow-up specimens at a later date. Every faecal specimen was tested for *C. parvum* using a modified acid-fast staining method. It was found that *C. parvum* was the second most common parasite detected over this period with an overall 5.5% positive rate per stool. Giardia was the most commonly detected parasite. *Cryptosporidium* was the only parasitic infection which showed a definite seasonal pattern with the highest rates in January to April. These findings were presented at the annual scientific meeting of the Australian Society for Microbiology 1994.

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**Confirmed Case of Ross River Virus Infection Acquired in Alice Springs March 1995**

*Peter Whelan, Vicki Krause DCC Darwin, Karl Horsburgh, Central Clinic Alice Springs, Gregor Sutherland, Jenny Rossiter DCC Alice Springs*

There have been a number of cases of epidemic polyarthritis reported from Alice Springs over the last few years, but few have been confirmed as acquired in Alice Springs. This report confirms a case of Ross River virus infection that was acquired by a 48 year old female in mid March on the outskirts of Alice Springs. The patient’s residence is in the northern urban area of Alice Springs near the Telegraph Station. The patient reported that there were very few mosquitoes in this area and this was confirmed by regular surveys carried out by the Alice Springs Council in association with the Medical Entomology Branch of the Department of Health and Community Services. The patient was last out of the Alice Springs area on 1 March 1995 during
a five day visit to Canberra where the patient was always inside at night and there were no reports of mosquito bites.

On 17 March the patient took part in a family bike ride at night on a rural circuit approximately 3.5 kilometres west of the urban edge of Alice Springs on the northern side of the MacDonnell Range between Flynn's Grave and Honeymoon Gap. The thirteen member group stopped along the road to repair punctures at approximately 11 pm in the moonlight. The patient reported considerable numbers of mosquitoes biting and one of the group resorted to spraying others with repellent. The group then rode further west to the Honeymoon Gap area for a midnight meal and stayed there from 12.30 am to 3 am. During this period they had track suits on and reported very few mosquitoes.

The patient reported feeling unwell on 21 March with loss of voice and tiredness. This persisted and on 27 March the patient went to her general practitioner who advised that she may have a viral infection. On 28 March the patient had a rash over most of her body lasting two days. She visited her general practitioner again on 29 March and a blood sample taken then for arbovirus serology was negative for Ross River virus. A repeat blood sample taken by her general practitioner on 4 April was positive for Ross River virus (IgG+ve, IgM+ve).

Between 1 and 8 April the patient reported to be very tired with painful joints first occurring in the fingers and then a shoulder and both hips. Later the knees, toes and elbows were affected. By 9 April the patient felt better. Stiffness and pain in her knees and feet returned on 14 April and have continued to wax and wane, with continuing tiredness.

The patient was unable to work from the time of loss of voice until the date of this report (28 April) and during this period took only Panadol as medication.

The Alice Springs mosquito monitoring program results show that between early February and early March this year there were relatively high numbers of Culex annulirostris, the mosquito species most likely to be the vector of Ross River virus in the Alice Springs area. The mosquito monitoring trap at the west end of Ilparpa swamp, approximately 6 kms south of Flynn's Grave on the southern side of the MacDonnell Range, consistently records the highest numbers of Cx. annulirostris in the Alice Springs area.

The first rise in mosquito numbers at the west end of Ilparpa occurred between 11 January (58 per trap night) and 25 January (272 per trap night). Numbers were over 2000 per trap per night from 8 February to 8 March, with a peak on 1 March of 3208 per trap night. By comparison the numbers at the east end of Ilparpa only reached a peak of 567 per trap night on 8 March. The Bloomfield trap site in the urban fringe just north of Heavitree Gap in the MacDonnell Range reached a peak of 82 per trap night on 22 February and was below 40 per trap night for the rest of February and March.

Mosquito fogging operations were delayed by access problems around Ilparpa but were commenced in the first week of March. The numbers of Cx. annulirostris reduced rapidly after 8 March as Ilparpa swamp began to dry out. The numbers recorded at the west end of Ilparpa were 894 (15 March), 374 (22 March), 173 (5 April) and 26 (12 April).

The numbers of Cx. annulirostris recorded at Ilparpa this year were the highest for at least five years, with the previous high of 2512 per trap night in April 1992. Last year there were no trap records of over 100 per trap night while in the previous year (1993), the highest number recorded was 1200 per trap night in February. The record numbers this year were the result of heavy rain beginning on 12 January (26ml) and continuing to 18 January (49ml) with little rain after this date in January or February.

Comment
This case highlights a number of important points regarding epidemic polyarthritis infection in general and in the Alice Springs area in particular.

The few laboratory confirmed cases of epidemic polyarthritis recorded from Alice Springs over the last ten years have not been verified as being acquired in the Alice Springs area. In the 1990-91 outbreak of epidemic polyarthritis in the Northern Territory, only one case was attributed to the Alice Springs area and this case was not fully investigated.1

This present case occurred just north of the MacDonnell Ranges. The most vulnerable area for mosquito attack and hence arbovirus transmission was previously considered to be south of the MacDonnell Ranges near the Ilparpa swamp.2 While the numbers of mosquitoes in the vicinity of Flynn's Grave is unknown, it is expected that the mosquito population would have been significantly lower than around Ilparpa but significantly higher than in urban areas. Numbers of mosquitoes in the area of probable transmission would have followed similar dates of abundance as at Ilparpa.

The time of approximately 13 days between the start of the recent rain and the detection of a rise in numbers of Cx. annulirostris accords well with the expected 7-10 days development time for the aquatic stages of Cx.annulirostris in the Alice Springs area. The four weeks between this first rise in numbers and the peak in numbers indicates that the mosquito population can continue to build up for at least four to five weeks after the end of rain. This species breeds in open sunlit fresh water, often with grass or other organic matter. While ephemeral or small pools dry up soon after flooding rain, large swamps and wetlands such as Ilparpa provide a relatively stable habitat to allow continued breeding and hence increase the potential for mosquito borne disease. The reported rapid drying of Ilparpa swamp is
unusual as it is normally maintained in a flooded state for extended periods by the discharge of excess sewage effluent from the adjacent treatment ponds. This reduction in flooding is probably due to the recent completion of a large evaporation pond to contain excess effluent.

East to south east winds aid in the dispersal of mosquitoes from the Ilparpa swamp to the west and north west, including the area where the infection was acquired. The direction of these winds and the presence of the MacDonnell Ranges helps keep the urban areas relatively free from the mosquitoes originating from Ilparpa swamp.

The time of transmission late at night indicates that although *Cx. annulirostris* exhibits peak numbers in the first two hours after sundown, exposure to mosquitoes after this period can still result in mosquito bites sufficient to cause infection.

The eleven day period from mosquito bites to the symptom of rash is within the three to 21 day incubation range, and close to the median nine day incubation period for Ross River virus. The first blood test for Ross River virus was taken at the time of the rash and illustrates the necessity for a second blood test seven to 14 days after first symptoms.

Personal protection from mosquitoes is important in reducing exposure and hence the risk of infection. The bike group ranged in age from 24 years to 55 years. No other member of the group acquired the disease, indicating that the patient was probably unlucky to be infected. The use of the repellent after the mosquitoes began biting possibly prevented other infections.

There have been 23 cases of laboratory confirmed epidemic polyarthritis reported from Alice Springs between 23 January and 15 March this year. From inquiries and doctors notes it is probable that nine cases were acquired locally, six appear to have been acquired elsewhere and eight are unknown. A cluster of three locally acquired cases occurred in the Larapinta estate on the western fringe of the urban area. This estate is the closest urban area to the site of infection reported above.

Epidemic polyarthritis cases have been relatively rare in Alice Springs despite the large number of residents. This relative freedom from disease can be attributed to both the local geography and to the mosquito program carried out both within the urban areas and around Ilparpa swamp. It appears that outbreaks of epidemic polyarthritis can occur in the Alice Springs area after extended periods of summer rain and that numbers of over 2000 *Cx. annulirostris* per mosquito trap at the Ilparpa (west end) monitoring site gives an indication of risk for Ross River virus infection.

References

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**Zidovudine (AZT) Reduces Perinatal Transmission of HIV - Implications for antenatal HIV testing**

*Frank Bowden, DCC Darwin*

Probably the only good news relating to HIV therapeutics to appear in 1994 was the release of the results from the AIDS Clinical Trials Group Study 076. This study showed that the use of zidovudine (AZT) in pregnancy was associated with a significant (and clinically important) reduction in the frequency of transmission of HIV from infected mother to child. The results have implications for those making policy relating to antenatal HIV testing.

The study was a randomised, placebo-controlled trial conducted at 35 sites throughout the U.S. Expectant mothers infected with HIV (all with CD4 counts >200/μl) were randomised to receive either zidovudine starting in the second trimester and continuing throughout the pregnancy or placebo. The babies born to women in the zidovudine group received the drug for the first six weeks of life.

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References

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**Table 1.**

<table>
<thead>
<tr>
<th>Mother given AZT</th>
<th>Mother not given AZT</th>
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<tbody>
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<td>8.3%</td>
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