

D(-)-Lactic acidosis may be more common than is thought and perhaps should be looked for in cases of metabolic acidosis in which the identity of the acid is not apparent.

I thank Professor J S Cameron, Dr C S Ogg, and Dr D G Williams for permission to report this case and Dr Pat Toseland for measuring the D(-)-lactate concentrations.

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(Accepted 17 January 1986)

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Diurnal variation in onset of acute closed angle glaucoma

Acute glaucoma results from closure of the angle in the anterior chamber of the eye by apposition of peripheral iris to cornea, which prevents the outflow of aqueous humour from the anterior segment; with continuing production of aqueous humour the intraocular pressure rises precipitously, producing the characteristic symptoms and signs of closed angle glaucoma—namely, decreased visual acuity, haloes around lights, and pain, which is often severe.¹ Diurnal variation of intraocular pressure is well recognised²; we attempted to determine whether the onset of acute closed angle glaucoma varies on a similar diurnal cycle.

Patients, methods, and results

One hundred consecutive patients (mean age 66.3 (SD 10.1) years) presenting with acute closed angle glaucoma referred to this glaucoma unit during the eight years to 20 December 1983 were analysed retrospectively. Each patient was questioned individually, by a single observer, to determine the time of day (to the nearest hour) when symptoms of acute glaucoma became apparent; as angle closure produces rapidly progressive, severe effects the onset of symptoms is a reasonable approximation to the start of the acute attack. Details were verified from patients' records. Acute closed angle glaucoma was significantly more prevalent among women than men (71 women *v* 29 men; $\chi^2=17.64$, *df*=1, *p*<0.001).

The table shows the diurnal variation in the time of onset of acute closed angle glaucoma, with a peak incidence during the evening and a trough in the morning.

Hourly distribution of onset of acute closed angle glaucoma over eight years

Time	No of patients	Time	No of patients
0100	2	1300	
0200	6	1400	
0300	1	1500	2
0400	2	1600	6
0500		1700	6
0600	2	1800	11
0700	8	1900	13
0800	4	2000	13
0900		2100	6
1000	2	2200	6
1100	1	2300	3
1200	1	2400	5

Comparison of the 12 hour periods 0400 to 1500 and 1600 to 0300 yielded a significant difference ($\chi^2=31.36$, *df*=1, *p*<0.001). The hypothesis of a constant incidence throughout the day was not reasonable ($\chi^2=86.24$, *df*=23, *p*<0.001), but when the logarithms of the observed counts were submitted to regression on a sine (hour) and cosine (hour) scale jointly on a 24 hour cycle assuming Poisson type errors, the regression was highly significant ($\chi^2=35.83$, *df*=2, *p*<0.001).

Comment

The depth of the anterior chamber of the eye is a dynamic variable that may change rapidly and transiently.³ Diurnal shallowing of the anterior segment has been shown; the depth and volume of the anterior chamber are significantly lower in the evening than the morning, and the anterior chamber angle decreases by 21%.⁴ This obviously facilitates the onset of angle closure; individual differences in diurnal shallowing of the anterior chamber may explain why certain eyes progress to overt angle closure though other, apparently similar, eyes do not.

Closed angle glaucoma is a medical emergency; during a typical episode intraocular pressure may be above 50 mm Hg (normal 10-20 mm Hg), producing irreversible ischaemic ocular damage within a few hours. This is the first significant evidence to confirm the hypothesis that acute glaucoma occurs mainly during the evening, with the following implications. Delay in management overnight may result in considerable impairment of sight; effectively, closed angle glaucoma is a form of blindness that may be prevented but only if management is started at an early stage. The onset of closed angle glaucoma is not easily recognised, but suspicious features include pain or decreased visual acuity with a fairly acute onset during the evening. A history of similar self limited episodes occurring at the same time of day, suggesting intermittent partial angle closure, would reinforce the diagnosis. Immediate ophthalmic treatment serves only to arrest the rapidly progressing ocular damage; of greater importance is early recognition by the general practitioner and immediate referral.

We thank Mr C West, University of Liverpool, for statistical advice, and Dr R Vogel, Merck Sharp and Dohme Ltd, for computer facilities. CVC is in receipt of the R D Lawrence research fellowship from the British Diabetic Association.

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(Accepted 13 February 1986)

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Source of infection in candida endophthalmitis in drug addicts

Heroin addiction is currently a major medical and social problem in Great Britain. An epidemic of presumed candidal endophthalmitis, a recognised complication of heroin abuse, was recently reported from Glasgow.¹ In this series an appreciable temporospatial clustering of patients was observed, suggesting a common source of infection. We report the results of our attempts to ascertain the possible origins of the infection in addicts.

Patients, methods, and results

Twenty three heroin addicts were diagnosed as having candidal endophthalmitis between November 1982 and August 1985. The diagnostic criteria have been described.¹

Analysis of drug diluent—The diluent used by 22 addicts was lemon juice from plastic lemons. Five patients submitted their current lemon for analysis; the caps and juices were cultured for fungal contamination. Two lemons yielded pure, heavy growths of *Candida albicans*. Two lemons were nearly full, indicating that they had been bought recently, and one was completely empty; these three lemons yielded negative results on culture. As a control seven plastic lemons bought six to 12 months previously were obtained from friends and colleagues; only one produced a growth of a non-pathogenic yeast. Of 15 lemons bought at random from corner shops in the area where the addicts lived, 11 were within their "best by" dates and yielded negative results on culture; *Aspergillus niger* was cultured from the juice of one of the four lemons past their "best by" dates.

Fungicidal effect of lemon juice—Sulphur dioxide is the preservative used in the plastic lemons. Juice from new lemons was inoculated with *C. albicans* and incubated for 48 hours; no growth was seen. The juice from new lemons that had been steamed for 10 minutes to drive off the preservative did not inhibit growth of candida.