

## AN ATYPICAL NEISSERIA CAUSING MENINGITIS

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A specimen of turbid cerebrospinal fluid was received from a male patient, aged 31 years, with the following history: 'Ill one day. Free purulent discharge from the left ear. Clinical diagnosis meningitis.' The patient died a few hours after admission to hospital. A post-mortem examination was not performed.

## CEREBROSPINAL FLUID

Direct films made from the deposit disclosed abundant pus, and numerous, rather large, Gram-negative intracellular diplococci. The pus was plated on horse-blood agar and Dorset's egg medium. After 24 hr. incubation at 37° C. a pure culture was obtained of an organism which, on further investigation, was found to possess the following characters:

*Morphology*

The organism is pleomorphic, but mainly coccial in form. The cocci are rather larger than meningococci; some appear in short chains, but the majority as diplococci. Large forms, somewhat resembling *Monilia* in shape, are also seen; some of these swollen forms are as long as 15–20 of the cocci. The organism was Gram-negative, but after repeated subculture one or two cocci have a slightly Gram-positive reaction. No motility has been observed, and no capsule, using both nigrosin and Muir's method.

*Cultural characters*

*Nutrient broth after 24 hr. incubation at 37° C.* is turbid with deposit. No soluble haemolysin is observed using horse-blood broth.

*Ordinary nutrient agar and horse-blood agar after 24 hr. incubation at 37° C.* There is abundant growth of round colonies variable in size, 1–4 mm. in diameter, greyish white in colour, low convex, somewhat mucoid and easily emulsifiable. Some of the colonies are rather glossy, others slightly matt, but by the third day both types look matt. Some of the colonies have a bevelled edge, and, when viewed from above, the centre of the colony appears whitish and the periphery almost clear. No alteration of the blood is noticed.

*MacConkey agar after 24 hr. incubation at 37° C.* On this medium also there is abundant growth of similar colonies. No alteration in the reaction of the medium is noticed.

*Biochemical reactions*

Acid, but no gas, is produced in glucose after 48 hr. incubation. No alteration is observed in maltose, saccharose, laevulose or lactose after 3 weeks. There is no liquefaction of gelatin after 6 weeks. Litmus milk is unchanged after 3 weeks. Indole, Voges-Proskauer, methyl red and the direct oxidase reactions are negative.

*Metabolism*

The organism grows well, both aerobically and anaerobically, and equally well at 37 and 22° C., and at 'bench' temperature.

*Serology*

Agglutination tests, using both tubes and slides, against meningococcal sera types I and II are negative. The organism is not auto-agglutinable at 56° C. overnight.

*Pathogenicity*

A mouse was injected intraperitoneally with 0.5 c.c. of a broth culture. It showed no ill effects after 3 days.

## CONCLUSIONS

It is highly probable that the organism isolated in pure culture is the same as that seen in the pus cells, both appearing as Gram-negative cocci rather larger than meningococci. This being so, the organism must be regarded as the presumptive cause of the meningitis, and not as a contaminant.

The taxonomic position of the organism is uncertain. It would seem that the organism should be classified as a pleomorphic Gram-negative coccus, more especially in view of its uniformly coccial morphology in the pus cells, and, hence, as a *Neisseria*. In several respects this organism resembles that described recently by McFarlan (1941), and Bray & Cruickshank (1943), as *Diplococcus mucosus*; for example, in producing abundant growth on MacConkey's agar; but their organism was encapsulated and apparently much less pleomorphic, and, moreover, yielded yellowish colonies.

Since cultural and biochemical characters, serology and pathogenicity are so variable in the *Neisseria* group as a whole, and since, in addition, the organism here described is pleomorphic, it would seem that some new criterion in classification is essential.

## SUMMARY

A pleomorphic, Gram-negative organism, apparently the cause of purulent meningitis, is described. Reasons for regarding it as a *Neisseria* are adduced.

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## REFERENCES

- BRAY, P. T. & CRUICKSHANK, J. C. (1943). *Brit. Med. J.* 15 May, p. 601.      MCFARLAN, A. M. (1941). *J. Path. Bact.* 53, 446.

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