Pasteurella haemolytica var. *ureae* from human sputum

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SYNOPSIS A new variety of *Pasteurella*, named by Henriksen and Jyssum (1960, 1961) *Past. haemolytica* var. *ureae*, has been isolated from the sputum of 17 patients, most of them elderly, suffering from chronic bronchitis or bronchiectasis. It has also been found in the normal respiratory tract. Whether the organism aggravates the disease or acts as a mere commensal when growing in the damaged tissue is not yet clear.

Recently Henriksen and Jyssum (1960, 1961) described the isolation from the human upper respiratory tract of a *Pasteurella*-like organism not previously recorded in the literature. They have named this organism '*Pasteurella haemolytica* var. *ureae*'. They isolated it from three patients with rhinosinusitis and from one with ozaena. In three of these instances other organisms of recognized pathogenicity were also present. Two further isolations of this organism have also been reported by Omland and Henriksen (1961).

One of us (D.M.J.) has isolated a number of strains of *Pasteurella haemolytica* var. *ureae* from routine sputum specimens. A detailed account of their bacteriology appears elsewhere (Jones, 1962). When a newly described organism is isolated it is of interest to determine what part it plays in the disease process of the patients. We wish to record here the type of case in which we have found this organism. In view of the well-known difficulty in assessing the role of any organism in the pathology of chronic bronchitis or bronchiectasis we are aware of the hazards of drawing any conclusions from such a small series as this.

FREQUENCY

The organism has been isolated from about 1% of routine sputum specimens examined, and we have found it to occur four or five times more frequently than *Pasteurella septica* in the same material.

BACTERIOLOGY

We have examined nearly 30 strains of *P. haemolytica*

var. *ureae* and they appear to form a homogeneous group, resembling each other closely. They are non-sporing, non-motile, Gram-negative rods, differing from *P. septica* in being larger, 0.5 to 0.7 μ wide, and variable in length with a tendency to form short filaments. Most of the strains we have seen have been capsulated. The colonies on blood agar are mucoid and somewhat similar in size and appearance to those of *P. septica*. There is no true haemolysis of horse blood agar but some greening of the medium occurs after 48 hours' incubation. Glucose, maltose, fructose, sucrose, and mannitol are fermented promptly and produce acid only. No indole is produced. All strains are very strongly urease positive on Christensen's urea agar (Christensen, 1946). The oxidase test (Kovacs, 1956) is positive; only small amounts of catalase are formed. There is no growth on MacConkey agar. Like *P. septica*, this organism is sensitive to penicillin, tetracycline, streptomycin, erythromycin, and chloramphenicol. No strain we have examined has been pathogenic for small laboratory animals.

CASE HISTORIES

These are summarized in the Table on page 248.

DISCUSSION

In nearly all our cases the colonies of *Pasteurella haemolytica* var. *ureae* predominated or were present in large numbers on the primary blood agar plates. It would seem that in these cases this organism formed an integral part of the respiratory tract flora. We have isolated it from the respiratory tract in the absence of symptoms from cases of acute bronchitis

TABLE
SUMMARY OF CASES EXAMINED¹

Case No.	Age	Sex	Case History	Comments
1	55	M	Inactive pulmonary tuberculosis, bronchiectasis, and chronic bronchitis	Acute exacerbation
2	70	M	Mild chronic bronchitis	Admitted with dysentery
3	58	M	No history of chronic respiratory disease. Admitted with small left pleural effusion which cleared rapidly	No clear cause established
4	61	M	Chronic bronchitis for 6 years, recent deterioration	Heavy growth of both pasteurellae and pneumococci
5	58	M	Discharging sinus after oesophagectomy; no respiratory symptoms	Pasteurellae grown from sputum on two admissions at an interval of 6 months
6	21	F	Bronchiectasis	
7	38	M	Chronic bronchitis since childhood	Pasteurellae and pneumococci isolated
8	44	F	Bronchitis since childhood	Acute exacerbation
9	44	M	Chronic bronchitis. Admitted on several occasions with acute exacerbations	Pasteurellae together with pneumococci isolated during one admission
10	3	F	Dysentery, no respiratory symptoms	Pasteurellae from nasal swab
11	72	M	Carcinoma bronchus	Pasteurellae and Friedländer's bacillus
12	63	M	Inactive tuberculosis and chronic bronchitis	Acute exacerbation
13	15	M	Bilateral bronchiectasis	Pasteurellae isolated three times during one month
14	16	F	Bronchiectasis	Pasteurellae during two exacerbations at an interval of one year
15	30	M	Acute bronchitis following common cold. No chronic chest disease. Pasteurellae not isolated from nose swabs in absence of symptoms	Pasteurellae isolated again eight months later during another acute episode
16	60	F	Chronic bronchitis	Unresolved pneumonia
17	51	M	Chronic bronchitis	Acute exacerbation

¹A strain of *P. haemolytica* var. *ureae* was isolated as the predominant growth in a case of post-operative pneumonia. This patient died three days after operation and at necropsy a bilateral bronchopneumonia was present but cultures taken were overgrown with coliforms.

and from cases with exacerbations of chronic chest disease. *Pasteurella septica* has been encountered in association with chronic chest disease (Mulder, 1938; Bezjak and Mimica, 1952; Cawson and Talbot, 1955). The organism we describe here, although easily distinguished from *P. septica*, is almost certainly closely related to it. Though both *P. septica* and *P. haemolytica* var. *haemolytica* are recognized animal pathogens there is no record of an organism resembling *P. haemolytica* var. *ureae* occurring in animals and it may prove to be restricted to the human host.

Possibly *P. haemolytica* var. *ureae* behaves in the same way as *Haemophilus influenzae*; that is to say, it may be present in the upper respiratory tract as part of the normal commensal flora and may invade

a damaged bronchial tree when conditions are favourable.

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