amount of protein is passed into the urine. This leads to a change in the concentration of the plasma proteins of the blood, and therefore the normal "indrawing force" in the capillary bed is lost; thus fluid is able to remain in the tissue spaces and the oedema is formed in this manner.

Fourthly, *nutritional oedema*—in this condition the essential factor is probably a very low protein intake, leading to a lowered plasma concentration and also to changes occurring within the epithelium of the capillary vessels. Fifthly, *inflammatory oedema*—in this type the toxins which are produced at the side of the lesion lead to paralysis of the capillary tone; therefore their permeability is greatly increased and so fluid passes into the tissue spaces. Sixthly, *lymphatic oedema*—obstruction of the lymphatics by growths or parasitic worms often leads to oedema, which may be due to interference with the removal of tissue fluid by the lymphatic channels.

Thus it will be seen that each type of oedema has a different physiological explanation which is acceptable, although it is probable that as our knowledge increases there will have to be some modification of these explanations.

Clinical Page

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CASE I

A CASE OF GRANULOPENIA, INTENSIFIED BY SUPERADDED INFECTIONS

This case is of interest as an example of the effects of a streptococcal tonsillitis and glandular fever upon a pre-existing deficiency of the granular white cells.

A soldier, aged 28, was first seen early in July 1942, when he complained of fever, malaise and sore throat for one week. His previous record included recurrent tonsillitis, chronic post-nasal catarrh, and an attack of sciatica two months previously, for which he had taken tablets of Veganin in considerable quantity for several weeks.

On examination he was well-nourished and not obviously anaemic, with a hot, moist skin. Temperature range 99²–103° F., Pulse 88–100, and respirations and blood pressure normal. No rash was observed. The tonsils were large, craggy and injected, and showed considerable follicular suppuration, and pus was streaming down the nasopharynx. Tongue dry and furred. The superficial lymphatic glands of cervical, axillary, tonsillar and inguinal groups showed a moderate, firm, discrete and tender enlargement, and the tip of the spleen was palpable and soft. No abnormality was found in any other system, nor in the urine. A throat swab was taken. A tentative diagnosis was made of glandular fever superadded to follicular tonsillitis, and specific treatment was withheld pending an examination of the blood, which gave the following interesting results; the findings were especially notable when contrasted with the clinical appearance of the patient, which did not suggest a severe illness.

Haemoglobin	102 per cent
Red cells	5,200,000 per c.mm.
Colour index	1·0
White cells	3,900 per c.mm.

Paul-Bunnell agglutination test:
Positive at a dilution of 1 in 136

Absolute number of polymorphs	624 per c.mm.
Polymorphs (neutrophil)	16·5 per cent
(eosinophil)	3 per cent
(basophil)	1 per cent
Small lymphocytes	52 per cent
Large lymphocytes	20 per cent
Mononuclear cells	7·5 per cent

Throat and pharyngeal swabs:
Haemolytic streptococci in pure culture

TREATMENT

Intramuscular injections of Pentose Nucleotide, 20 c.c. were given daily, together with 2 c.c. of liver extract by the same route, to stimulate granulopoeisis. A liberal diet of high purine content was advised, with high fluid intake, and local treatment for the throat. Ascorbic acid 100 m.gm. daily was deemed advisable in view of the severe infection of the upper respiratory tract.

RESULT

This treatment produced no ill effects except an intensification of malaise with slight evening rigors, not uncommon with PENTIDE. Four days' therapy produced the following change in the blood picture:

Haemoglobin	104 per cent
R.B.C.	5,210,000
C.I.	1·0
W.B.C.	9·750 per c.mm.

Red cells normal in size, shape and staining.

Polymorph neutrophils	58·75 per cent
,, eosinophils	1·5 per cent
,, basophils	0·75 per cent
Large lymphocytes	4 per cent
Small lymphocytes	25·5 per cent
Abnormal mononuclears	9·5 per cent

Clinical and haematological improvement continued after cessation of therapy one week later. Sternal puncture was not considered justifiable or essential.

COMMENT

The granulopenia in this case probably dated from a sensitisation of the bone-marrow by phenacetin, and was undoubtedly intensified by the advent of a haemolytic streptococcal infection of the throat, and of glandular fever.

Convalescence was complete and uneventful after an illness lasting four weeks, and tonsillectomy has now to be considered. The decision to withhold chemotherapy proved somewhat providential when the blood count became known, and this case is therefore not without a moral.

CASE II

A CASE OF BRONCHIAL ASTHMA WITH DEATH FROM CARDIAC FAILURE

Although it is commonly stated in the textbooks that death during an attack of bronchial asthma is almost unknown, it is probable that fatal acute failure of the right ventricle is not uncommon, more particularly during the status asthmaticus. The following is an account of such a case.

CASE NOTE

A young married woman of 25 was first seen in a severe attack of bronchial asthma on August 1st, 1942. She had been subject to such attacks for ten years, and three years previously was fully investigated in hospital, where an infected antrum was drained. Thereafter there was partial relief, which was reinforced by a course of specific protein desensitisation, but complete freedom from asthma was not achieved, except during her first and only pregnancy in 1935. Of late her attacks had become more frequent and distressing, and on questioning, she admitted that this coincided with a period of financial stress and unhappiness at home.

On admission to hospital she was seen to be a stoutly-built subject with an apprehensive appearance, and in a typical asthmatic attack which had already lasted for six hours without relief. There was marked cyanosis of the face, lips and finger-nails, and slight engorgement of the jugular veins; this, together with an accentuated pulmonary second sound, was the only sign of cardiac stress. No other abnormality was found outside the cardio-respiratory system except for some dry pharyngitis. The temperature was 99·2° F., pulse 120, respiration rate 32/minute, and blood pressure 130/80 mm.

TREATMENT AND COURSE

Adrenalin m. 10 was injected hypodermically, and continuous oxygen administered through a B.L.B. mask. Gardenal gr. 3 was given as a sedative, and strophanthin gr. 1/100 by hypodermic injection four-hourly. Despite these measures, there was only partial relief. Adrenalin by the method of Hurst, and autohaemotherapy with 10 c.c. of blood, also failed completely to overcome the physical and mental distress, but intervals of sleep were obtained.

Twenty-four hours after the onset of the attack, the condition of the heart began to cause anxiety. There were now signs of cardiac dilatation, chiefly right-sided, with considerably raised venous pressure and pulsation in the neck, scattered moist sounds at both lung bases, and downward enlargement of the liver. Cyanosis was more marked, especially in the extremities, which were cold. The pulse was 132 and blood pressure 150/82, and the patient was gradually becoming exhausted. A pint of blood was removed by venesection, and thereafter the Strophanthin injections were continued intravenously, and in view of the urgent necessity for sleep, Omnopon gr. 1/3 was given hypodermically. Brandy ½ oz. was given three-hourly, and warmth applied to the limbs. Despite these measures, the cardiac condition failed to improve, but the signs of right ventricular stress appeared increasingly to dominate those of the asthmatic state, until sleep merged imperceptibly into unconsciousness. Forty-eight hours after the onset of her attack of asthma, the patient died with all the signs of right-sided heart failure (acute cor pulmonale).

Permission for an autopsy was unfortunately not obtained.

COMMENT

This case serves to emphasise the need for careful and repeated observation of the cardiac condition in every case of bronchial asthma in which the attack is severe, prolonged and resistant to the usual methods employed for its relief. In cases where a psychogenic element may contribute to the tachycardia, the early exhibition of sedatives may in some measure lessen the work of a heart which is showing signs of stress, and opium should probably not be withheld.