POLYCYTHAEMIA AND MYELOSCLEROSIS

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It is now fairly well recognized that myelosclerosis may present with polycythaemia (Stone and Woodman, 1938; Vaughan and Harrison, 1939; Marson and Meynell, 1949; Hutt, 1950). The problem of the relationship of this condition to polycythaemia rubra vera is still undecided. Rosenthal and Bassen (1938) believe that polycythaemia rubra vera can terminate with myelosclerosis. The question arises whether myelosclerosis follows as a natural sequence in the disease process or whether it is due to the effect of therapy. Wyatt and Sommers (1950), in a study of 30 cases, state that marrow sclerosis is more likely due "to the eventual attrition of the haemopoietic system by the chemical and physical agents employed to reduce the erythrocyte count." We reported two cases of polycythaemia with myelosclerosis which were treated with deep x-ray therapy (Marson and Meynell, 1949). The case recorded below has had acetylphenylhydrazine over a number of years. Deep x-ray therapy has never been used.

Case Report

A man aged 61 was admitted to hospital in 1943 with pneumonia. A blood count showed he had polycythaemia, which was considered to be of the primary type. Since then he has had repeated courses of acetylphenylhydrazine, 0.1 g. weekly. In 1945 the Wassermann reaction was positive and he was given neoarsphenamine and bismuth. A blood count in May, 1945, was as follows: Red cells, 5,590,000; haemoglobin, 105%; white cells, 18,000; neutrophil premyelocytes, 2%; neutrophil metamyelocytes, 3%; neutrophil polymorphs, 75%; lymphocytes, 15%; mononuclears, 2%; basophil polymorphs, 3%.

In 1946 his Wassermann reaction was still weakly positive, and he was given penicillin in oil, 250,000 units daily for ten days. In 1948 the enlarged spleen was found to extend down to the pubis. There was no enlargement of lymph nodes. The haemoglobin was 117%, and white blood cells 28,800 per c.mm. A differential count showed a few myelocytes and some normoblasts. In August, 1950, he developed pain in his chest and was transferred to this hospital.

On examination he was plethoric and well nourished. The spleen extended into the right iliac fossa. No enlarged lymph nodes were found. A blood count showed: Red cells, 6,660,000; haemoglobin, 120% (Haldane); colour index, 0.91; white cells, 21,100; neutrophil polymorphs, 64%; eosinophil polymorphs, 1.5%; basophil polymorphs, 2%; lymphocytes, 9%; monocytes, 2.5%; N. metamyelocytes, 10.5%; N. myelocytes, 6.5%; N. premyelocytes, 4%. Stained films showed anisocytosis and poikilocytosis with polychromasia. Platelets were 523,000 per c.mm. X-ray films of the long bones showed no abnormality.

Sternal puncture produced a specimen which consisted mainly of cells found in the peripheral blood, but in addition there appeared to be an excess of megakaryocytes. Puncture was repeated with the same result. A sternal biopsy showed a pronounced fibrosis of the marrow cavity and an increase in megakaryocytes. The picture was consistent with the diagnosis of myelosclerosis.

The patient was discharged with a haemoglobin of 100% and a red-cell count of 5,458,000 per c.mm. He is now attending the out-patient department and all therapy has been stopped.

Discussion

The case is of interest for several reasons. Definite myelosclerosis was present with no anaemia. It is now generally accepted that the splenomegaly is compensatory to the marrow involvement. As this extends, the compensatory hyperplasia of the extramedullary foci of haemopoiesis fails to equalize the marrow replacement, and anaemia results. If it is assumed that various agents—for example, benzene, x rays, phenylhydrazine, etc.—act by a process of "attrition," it must be accepted that they will also act on the extramedullary foci as well. A similar process of fibrosis should be evident in the extramedullary foci. This has not been demonstrated.

Wyatt and Sommers, describing the microscopical picture of various extramedullary foci, state of the lymph nodes: "Small groups of myeloid and erythroid cells and scattered bizarre megakaryocytes are found in the sinusoids, dilating them, but not often producing a clinically apparent lymphadenopathy. In addition, the lymphoid tissue shows minimal hyperplasia, and normal architecture is preserved *without necrosis or fibrosis*" (our italics). In describing the other sites—for example, liver, renal pelves and cortex, subserosal fat of the gastro-intestinal tract, sinusoids of adrenal cortex—they state that "qualitatively these foci resemble those already described"—that is, there is an absence of necrosis or fibrosis. The spleen does show some increase in fibrous tissue, but other factors such as infarction and deposition of iron pigment operate.

In the case here described x-ray therapy has never been used. It is now widely accepted that deep x-ray therapy to the spleen in myelosclerosis is contraindicated. In a follow-up of the two cases previously recorded (Marson and Meynell, 1949) one complained of continuous severe pain over the spleen, presumably related to its enormous size. This was so severe that the patient stated that life was becoming unbearable. Small doses of deep x rays were applied to the splenic area: over a period of two weeks a total of 390 r was given. This caused an appreciable reduction in the size of the spleen. The blood count fell slightly during the next fortnight. She was given transfusions. Her blood picture improved, and a year later she said she had remained free from pain.

Conclusion

A case of myelosclerosis without anaemia is described. This case was originally diagnosed as polycythaemia rubra vera. It is believed that the recognized therapeutic agents used in the treatment of this condition play no part in producing myelosclerosis. In the present case deep x-ray therapy was never used. Although it is generally agreed that x-ray therapy to the spleen is contraindicated in myelosclerosis, it may be of value in small doses when there is severe pain over the spleen.

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REFERENCES

- Hutt, M. S. R. (1950). *Proc. roy. Soc. Med.*, **43**, 903.
Marson, F. G., and Meynell, M. J. (1949). *British Medical Journal*, **2**, 1384.
Rosenthal, N., and Bassen, F. A. (1938). *Arch. Intern. Med.*, **62**, 903.
Stone, D. M., and Woodman, D. (1938). *J. Path. Bact.*, **47**, 327.
Vaughan, J. M., and Harrison, C. V. (1939). *Ibid.*, **48**, 339.
Wyatt, J. P., and Sommers, S. C. (1950). *Blood*, **5**, 329.

The Annual Conference of the British Hospitals Contributory Schemes Association (1948) this year will take place in Cardiff, by the kind invitation of the Lord Mayor and City Council, on October 23 and 24. Dr. Ffrangcon Roberts, author of *The Cost of Health*, has consented to be the association's guest speaker at this conference.