GOUT

DEFINITION

1. Gout is a term representing a mixed group of genetic and acquired diseases manifested by hyperuricaemia (raised level of uric acid in the blood) and characteristic inflammatory arthritis induced by deposition of microscopic crystals of monosodium urate monohydrate. These crystals are also deposited in other tissues.

CLINICAL MANIFESTATIONS

2. Some patients develop aggregated deposits called **tophi** in and around limb joints, sometimes large enough to be severely disabling. Tophi may also form on the ears and can also occur in many other sites eg. heart and penis, but not in the lungs, liver, spleen or central nervous system. Many patients have some degree of **chronic urate nephropathy** (diseased kidneys), which is commonly fatal in untreated chronic gout. Uric acid stone formation in bladder and/or kidneys is common in gout, but not exclusive to gout, occurring in about 20% of cases. This is 200 times its occurrence in the general population.

3. Some patients develop all the above features but they can occur in different combinations.

4. Hyperuricaemia alone, even with urolithiasis (stone formation), is not gout. Over 90% of people with moderately raised levels of uric acid do not develop gout.

5. The onset is usually acute, with inflammatory arthritis, tenosynovitis, bursitis or cellulitis. In about 70% of cases the initial presentation is with acute arthritis of the first metatarsophalangeal joint (base of the big toe) although any **distal** joint may be affected.

6. Within hours, the affected joint is acutely painful, swollen and exquisitely tender. Maximal inflammation occurs within a day. There may be accompanying headache, fever and general malaise.

7. Acute attacks usually subside within a few days, and more rapidly with specific treatment, which is sometimes used as a diagnostic test. In the earlier stages the joint returns to normal. These acute episodes occur sporadically, more often in the spring, usually monoarticular at first, later becoming polyarticular. Intervals between attacks may vary from months to many years.

8. If gout is untreated, the attacks become more prolonged and more joints are involved. Tophi form in the neighbourhood of affected joints, in olecranon and pre-patellar bursae, on the ears and in the tendons of fingers and toes. As the disease progresses to **chronic gouty arthritis**, the joints become stiff, enlarged, deformed and often affected by secondary osteoarthritis.

9. When there is renal impairment, hypertension is a frequent complication.

10. Gout is a treatable condition and progression to the chronic tophaceous stage is now uncommon.

AETIOLOGY

11. Gout is primarily a disease of adult men, with onset usually in middle age, and only about 5% of cases being found in women. Estimates of prevalence vary widely but it is increasing. It has been estimated that a British GP with a list of 2,000 might have about 18 patients at risk of gout. In the USA it is the commonest cause of inflammatory arthritis in men over 40 years of age.

12. Other than gender and age, risk factors for development of gout, all of which are mediated through raised levels of serum and tissue urates, include:

    12.1. A family history of gout. About 25% of first-degree relatives of gouty subjects are hyperuricaemic and about 20% of these have symptomatic gout

    12.2. Obesity

    12.3. Excessive alcohol consumption (a particular association with port wine is fallacious)

    12.4. Occupational or environmental exposure to lead

    12.5. Renal impairment not primarily gout-related

    12.6. Hypertension treated by diuretic drugs

    12.7. Other uses of diuretic drugs

    12.8. Ethnicity. For example, Polynesians and Maoris are at greater risk and the black races at less risk of having gout.

    12.9. Urbanisation. Ethnic groups in more westernised countries tend to have higher rate levels. This may be related to dietary factors.

13. The association of high serum urate level with high protein and purine intake, alcohol, weight body bulk and social class suggest that, in most communities, hyperuricaemia is associated with plenty, or at least relative affluence.

14. Gout is a disorder of **purine metabolism**. Purine and pyrimidine are the base substances of nucleotides, the “building blocks” from which the nucleic acids, RNA and DNA, are formed. **Purines** include purine itself and other bases derived from it. They are key substances in almost every branch of human metabolism. In man and other primates, the end product of the metabolism of purines is uric acid, two thirds of which is excreted via the kidneys and one third via the gut.

15. The concentration of urate in body fluids and tissues is determined by the balance between **absorption and production** of purine compounds on the one hand and **destruction and excretion** on the other. Thus, the major factors in raising urate levels are:

15.1. Excessive breakdown of body purines. The fault may be genetic, or an increase in endogenous purine may occur in certain diseases such as the myeloproliferative diseases, leukaemia's, psoriasis and in a variety of situations such as infections and extensive surgery. Such increases lead to overload of the system causing hyperuricaemia and gout.

15.2. Breakdown of excess ingested purines, but this is very rarely an important factor in the absence of a metabolic disorder like those mentioned above.

15.3. Altered renal excretion of uric acid, which may be genetically determined or due to renal disease or certain drugs or toxins such as lead.

16. The reasons why gout occurs predominantly in distal joints is that their temperature is lower, encouraging deposition of urates from saturated solution. For the same reason, exposure to extreme cold can precipitate an acute episode, but only in a person in whom gout is "waiting to happen" because of hyperuricaemia. Although episodes of gout may also be triggered by trauma or even minor surgery. None of these things is a basic cause of gout.

17. There is no evidence that gout can be caused or triggered by psychological trauma.

CONCLUSION

18. Gout is a syndrome characterised by **hyperuricaemia** and **crystal deposition causing arthritis.** When no other disease or external cause is responsible and the cause in genetic, it is called **primary gout.** When it is caused by another disease, toxin or drug, it is called **secondary gout.**

PSEUDOGOUT

DEFINITION

19. This also is an episodic inflammatory arthritis caused by micro-crystal deposition, but quite distinct from gout. In pseudogout, the crystals are of **calcium pyrophosphate dihydrate** (CPPD) shed from cartilage affected by calcific change. Definitive diagnosis can only be made by microscopic examination of joint fluid, but the clinical pattern differs from gout.

CLINICAL MANIFESTATIONS

20. The attacks are usually self-limiting and may be acute or subacute, but are rarely as acute of severe as in gout and are harder to diagnose. It is not associated with hyperuricaemia but it coexists with gout.

21. Pseudogout tends to occur in older people than does gout. Men and women are equally prone. It is a common cause of mono-arthritis in the elderly and may complicate osteoarthritis. It rarely affects many joints at once.

22. The distribution is also different from gout and the joints most likely to be affected are the knee, wrist, shoulder, ankle and sacro-iliac, in that order.

23. Tophi do not occur in pseudogout.

24. Attacks can be triggered by intercurrent illness or surgery.

AETIOLOGY

25. The basic cause of pseudogout is obscure, but it is commonly associated with **chondrocalcinosis** (deposition of calcium in the cartilages of joints).

26. Systemic diseases which may be associated with pseudogout are hyperparathyroidism, hypothyroidism, haemochromatosis and possibly diabetes.

CONCLUSION

27. Pseudogout is another **crystal deposition** disease, which may mimic gout or coexist with it, but generally affects different joints in older people.

REFERENCES

Duthie R B and Bentley G. Mercer's Orthopaedic Surgery. 8th Ed. 1983. London. Edward Arnold. p642–644.

Turek S L. Orthopaedics. Principles and Their Application. 4th Ed. 1984. Philadelphia. J N Lippincott Company. p246–251.

Resnick D. Diagnosis of Bone and Joint Disorders. 3rd Ed. 1995. Philadelphia. W B Saunders Co. Section 7.

Hershfield M S. Cecil's Textbook of Medicine. Philadelphia. W B Saunders Co. 20th Ed. 1996. p1508 et seq.

Schumacher H R. Cecil's Textbook of Medicine. Philadelphia. W B Saunders Co. 20th Ed. 1996. p1515.

Wallace S L, et al. Arthritis and Rheumatism. 1997. p20.895-20.900

Nuki G. Oxford Textbook of Medicine. 3rd Ed. 1996. p1376 et seq.

Doherty M. Oxford Textbook of Medicine. 3rd Ed. 1996. p2984 et seq.

Snaith M. Gout, Hyperuricaemia and Crystal Arthritis. Br. Med. J. 1995. p521-524.

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