An estimated third of rheumatologists send aspirated synovial fluid samples for culture routinely during the course of management of their patients irrespective of the underlying diagnosis. This is done apparently even when sepsis is not suspected. This audit of 507 synovial fluid culture requests revealed that positive bacterial growth was rare even when sepsis was queried on the request forms but none was positive in any of the routine samples. Our findings throw doubt on the value of routine synovial fluid culture. We recommend that such cultures are undertaken when infection is a possibility and in immuno-compromised patients. An average health district would save £3000 per annum if such a policy was adopted, but across the National Health Service as a whole the total expenditure saved on this unnecessary investigation would be considerable.

KEY WORDS: Synovial fluid, Routine culture, Sepsis, Cost-saving.

SYNOVIAL fluid analysis for cell counts and crystals is one of the most useful investigations in rheumatological disorders when the diagnosis is uncertain [1]. Similarly, synovial fluid culture is essential in suspected cases of septic arthritis or when aspirated fluid looks suspicious or unduly turbid [2]. In practice, it seems that a large number of aspirated synovial fluid samples are routinely sent for culture despite no suspicion of sepsis. We base this statement on a questionnaire study [3] asking rheumatologists their routine practice regarding this aspect: 22% stated that they did send all aspirated synovial fluids for culture as a routine matter even if sepsis was not in question. This also seemed to be our local practice—where routinely all aspirated fluids are sent for culture. Furthermore, when we presented this paper as an abstract at the recent British Society for Rheumatology meeting in London [4], the chairman asked for a show of hands of those who sent samples for culture just as a routine practice. Of the estimated 400 rheumatologists attending at the time, an estimated minimum of one-third indicated that they did so. As such, throughout the NHS it is likely that a huge number of synovial fluids are apparently cultured even when sepsis is not suspected.

We audited requests in two districts to assess the value of routine synovial fluid culture.

PATIENTS AND METHODS

Sample requests (n = 99) for synovial fluid culture from South Manchester University Hospitals NHS Trust (SMUHT) for three consecutive months were analysed, the sources of referral being as follows: rheumatology 25, orthopaedics 11, accident and emergency 17, medical disciplines 10, miscellaneous 36. Similarly, 408 requests to Stockport district hospitals in 1 yr were analysed. The sources of referral were as follows: the majority, i.e. 225 samples (55%), were from the rheumatology department, including from ‘cold’ elective admission beds and out-patients; 66 samples (16%) were from orthopaedic wards or patients admitted from accident and emergency or out-patient departments; 24 samples (6%) were from general medical out-patients; and 29 (7%) were from general medical wards and miscellaneous group. General practitioner (GP) originated samples amounted to 64.

RESULTS

Analysis of SMUHT samples revealed that details (e.g. age or sex of patient, source/site of aspirated synovial fluid, underlying diagnosis or information as to whether sepsis was suspected or not) were lacking in 54 request forms, six of which were positive for Staphylococcus aureus (St ar), i.e. >11% of the samples; infection was queried in 12 samples, of which three were positive, i.e. 25% (two St ar and one Streptococcus); joint effusion was mentioned on 11 request forms, of which one was positive for Clostridium perfringens from enrichment culture only (significance); clinical details were illegible in 19 samples, of which all were negative for growth; two samples were from patients with carcinoma of the lung, of which one was positive for St ar, and in one patient cellulitis was the diagnosis and the fluid from this patient was positive for St ar. From the patient details available on the request forms, a random 33
patients’ records were analysed for further details. The age range was 12–94 yr with 23 male and 10 female patients. Their diagnoses included rheumatoid arthritis (RA) (4), osteoarthritis (OA) (9), bursitis (4), injury (5), ?sepsis (3), ?gout (2) and miscellaneous (6). No entry was recorded in the notes of the fact that the synovial fluid was sent for culture in 19 cases (in the rest this was so recorded). In the discharge summaries to the GP, no information relating to synovial fluid culture was included in 18 of the patients.

Stockport samples were as follows: female 220 (54%), male 187 (46%). On one sample the gender was not stated. The majority (344) of the samples were from hospitals (84.3%) and 64 samples came from GP practice (15.7%). From rheumatology department and elective admission patients, the diagnoses discernible included RA (n = 98) and a smaller number were OA patients (n = 14). In only 24 samples was sepsis actually queried on the request forms. In the remainder, it was not possible to get any diagnosis from the request forms. The number with bacterial growth was 19 (4.7%), of which 12 were St ar, six coagulase-negative Staphylococcus and one anaerobic cocci. The bacterial growth samples came from either general medical wards or casualty and there was not a single bacterial growth from one anaerobic cocci. The bacterial growth samples were St ar, six coagulase-negative

In rheumatological practice, it is customary to perform synovial fluid analysis, where sample is available, to aid diagnosis [1]. Synovial fluid culture is undeniably of the utmost importance where sepsis is clinically suspected or needs to be excluded in certain complicated clinical situations, e.g. in immunocompromised patients [2]. The value of routine synovial fluid culture is, however, doubtful when treating patients with an already established diagnosis such as RA, OA or even one of the connective tissue disorders provided, on individual patient’s assessment, sepsis is not a possibility. A large proportion of the known rheumatoid patients admitted for routine management, e.g. joint aspiration and steroid injection, have a stable clinical condition with no apparent possibility of sepsis of the joints in question. It is in these patients that routine synovial fluid culture would appear to be unnecessary. However, any synovial fluid samples looking unduly turbid and samples from immunocompromised patients should be cultured. Non-inflammatory fluids, e.g. from OA patients, do not require this extra precaution.

From our estimation, perhaps a third of rheumatologists routinely send all aspirated synovial fluids for culture even when sepsis is not in question. Most of these practitioners apparently do not wait for the culture report to appear before injecting joints with steroids. Thus, there seems to be no logic in sending synovial fluid for culture unless, of course, sepsis is suspected.

Our audit findings indicate that routine culturing of aspirated synovial fluids may be unnecessary, especially when treating patients in cold/elective admission beds. A more cost-effective way of using limited resources may be culturing fluids when there is a clinical indication, in immunocompromised patients, or in doubtful cases. As synovial fluid culture costs around £7.50 per sample, this could mean an average cost saving for a district of ~£3000. Thus, the saving in the NHS as a whole could be considerable.

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REFERENCES