Abstracts

These selected abstracts and titles from the world literature are arranged in the following sections:

Syphilis and other treponematoses
(Clinical and therapy; serology and biological false positive phenomenon; pathology and experimental)

Gonorrhoea
(Clinical; microbiology; therapy)

Non-specific genital infection

Reiter’s disease

Syphilis and other treponematoses (Clinical and therapy)

Destructive bone disease in early syphilis

Although destructive bone lesions are well recognised manifestations of late syphilis, they are very uncommon in early syphilis. This paper reports a case of secondary syphilis with such lesions.

A 32-year-old man presented with a two-week history of malaise, fever, chills, headache, pain in the right shoulder, and perianal lesions. Clinical examination showed a generalised lymphadenopathy, a painful swelling over the right sternoclavicular joint, and multiple perianal condylomata lata. Neurological examination showed no abnormality.

The fluorescent treponemal antibody (FTA–ABS) test was positive, as was the rapid plasma reagin (RPR) test (titre 1 in 256). The cerebrospinal fluid showed: WBC 30 × 10^6/l (30/mm³), protein 0.36 g/l, and negative Venereal Disease Research Laboratory (VDRL) test. A moth-eaten appearance of the proximal part of the right clavicle and multiple mottled osteolytic lesions of the frontal and parietal bones were seen on radiological examination. Biopsy of bone from the right clavicle showed a heavy infiltration with lymphocytes and plasma cells suggestive of syphilitic osteomyelitis. Rapid resolution of all lesions followed a course of procaine penicillin 600 000 units daily for 10 days.

The authors discuss in detail the pathological and clinical manifestations of bone and joint involvement in early syphilis.

C. S. Ratnatunga

Persistence of Treponema pallidum following penicillin G therapy. Report of two cases

A 62-year-old man with asymptomatic neurosyphilis was treated with 1.2 megaunits of benzathine penicillin G three times weekly for three weeks. Two weeks later his cerebrospinal fluid still showed: WBC 40 × 10^6/l (40/mm³) and motile treponemes were seen. A specimen taken a week later contained 2 cells/mm³ but produced a darkground positive orchihtis three weeks after inoculation into the testes of two rabbits. A fourth specimen of CSF was normal except for positive FTA tests (which had also been positive on the previous specimens), but was again shown to infect rabbits. The patient was re-treated with 9.6 megaunits of benzathine penicillin G intravenously daily for 10 days. Further specimens of CSF taken after three and six months were normal except for positive FTA tests and did not infect rabbits.

The second patient had been given 2 g tetracycline daily for 10 days for a generalised maculopapular rash. A month later he was found to have positive VDRL, TPI, and FTA–ABS tests. The CSF was normal except for a positive FTA test but produced a darkground positive orchihtis after injection into rabbits. He was treated initially with 4.8 megaunits of benzathine penicillin G intramuscularly. When the results of the infectivity test were known he was given 20 megaunits of benzathine penicillin G daily for three weeks. CSF obtained after this did not infect rabbits.

 Persistency and tetracycline penetrate poorly into the CSF. These well documented infectivity tests show that in these two cases the initial treatment, adequate by American criteria, was ineffective.

A. E. Wilkinson

Neurosyphilis and penicillin levels in cerebrospinal fluid

This study was carried out on 15 men whose sera gave positive VDRL and
FTA–ABS tests and whose CSFs showed reactive VDRL tests and raised cell counts. Four of the patients were asymptomatic. Thirteen were treated with 3-6 megaunits of benzathine penicillin G weekly for four weeks and two were given 5 and 10 megaunits of aqueous penicillin G intravenously for at least 10 days. CSF was obtained immediately after completion of treatment and the penicillin level assayed with Sarcina lutea.

Twelve of the 13 patients given benzathine penicillin had no detectable penicillin in their CSF and one patient had a level of 0.1 μg/ml. The levels in the patients given 5 and 10 megaunits of penicillin G were 0.3 and 2.4 μg/ml respectively. Neither showed pleocytosis after treatment but the cell counts remained high in five of the patients given benzathine penicillin.

It is suggested that the recommended forms of treatment of neurosyphilis need reappraisal. Treatment with large intravenous doses of penicillin should be adopted so as to ensure treponemical levels of penicillin in the CSF.

A. E. Wilkinson

Tertiary syphilis in Denmark 1961-70. Description of 105 cases not previously diagnosed or specifically treated.


The decline of neuros for T. pallidum pallidum antibodies (MHA–TP). A new treponemal test for syphilis. Where does it fit?


The status of a new treponemal test, the microhaemagglutination assay for Treponema pallidum antibodies (MHA–TP). A new treponemal test for syphilis. Where does it fit?


The status of a new treponemal test, the microhaemagglutination assay for Treponema pallidum antibodies (MHA–TP) is reviewed and compared with regard to its sensitivity, specificity, and current clinical application to the VDRL slide test, the most widely used non-treponemal test, and to the manual FTA–ABS test, the standard treponemal test.

At present, the MHA–TP test seems to combine the simplicity and lower cost of non-treponemal tests and the sensitivity and specificity of treponemal tests, and thus enjoys features of both a screening and verification procedure. However, additional clinical experience with the test is needed before its role in the serological diagnosis of syphilis can be conclusively determined.

Author's summary

Syphilis (Serology and biological false positive phenomenon)

Problems with beaded fluorescence pattern in FTA–ABS test


The significance of false-positive FTA–ABS fluorescence in connective tissue diseases and other clinical conditions was evaluated by studying the sera from several groups of patients. In 12% of 67 patients without syphilis, sera with an antinuclear antibody (ANA) titre of 1:32 or greater gave low intensity FTA–ABS test fluorescence. In 20% of 150 patients (2.7% with a history of syphilis), sera with rheumatoid factor (RF) titres of 1:640 or greater demonstrated some reactivity. Only 1.3% of 75 donors of normal blood showed low-grade FTA–ABS fluorescence. In 385 patients with diagnostic problems, 2.1% of the sera demonstrated the beaded pattern. Patterns varied, depending on the treponemal antigen preparation and the duration of serum storage. Also, multiple specimens from the same patient produced different patterns. Furthermore, the beaded pattern could be demonstrated in patients with a history of syphilis, with other medical disorders, and in apparently normal persons.

Author’s summary

Syphilis (Pathology and experimental)

Examination of various cell culture techniques for co-incubation of virulent Treponema pallidum (Nichols 1 strain) under anaerobic conditions


The survival of Treponema pallidum was studied in cell culture media alone, in cultures of rat glial and human peripheral blood mononuclear cells and in the supernatants after growth of these two cell lines. Treponemal counts were performed at intervals and the number of virulent organisms assessed by the time taken for lesions to develop after intradermal inoculation into rabbits.

Supplementation of media with sodium pyruvate, sodium thioglycollate, and serum ultrafiltrate increased the survival time of the organisms, as did an anaerobic environment containing H2 and CO2. One or two megaunits of the treponemes became attached to the tissue cells and remained motile for up to 120 hours. Survival of 50% of the treponemes for 144 hours was obtained in spent (cell-free) medium from prepuce cell cultures mixed with preincubated reduced fresh medium and the thiamine and supplements mentioned above. The number of treponemes appeared to increase at first but it was not possible to achieve continuous passage. A decline in the number of virulent treponemes was found to begin about 12 hours before the decline in the number of motile organisms.

[Cell culture systems appear to provide factors which promote survival of T. pallidum. Identification of these factors may be an important step in the directed generation of producing continued growth and multiplication of T. pallidum in vitro.]

A. E. Wilkinson

Gonorrhoea (Clinical)

Gonococcal sepsis secondary to fetal monitoring


A case of fetal monitoring (with intravenous and uterine catheter and fetal scalp electrode) was described which was complicated by the third postpartum day by pyrexia and the baby was found to have positive blood cultures for Neisseria gonorrhoeae. N. gonorrhoeae was also cultured from the amniotic fluid. Cultures from the maternal cervix and endometrium were also positive, but the maternal blood was negative. Significantly, and indicating that a transplacental route of infection was unlikely, maternal and cord blood cultures were negative. An interesting feature was
that the mother had been treated for pharyngeal gonorrhoea during the first trimester (the treatment is not described).

The authors conclude that in spite of the low morbidity associated with fetal monitoring, current or recent maternal infection with *N. gonorrhoeae* should constitute a contraindication for this procedure.

(In populations where gonorrhoea is very common, routine screening for maternal gonorrhoea might be indicated before embarking on intrapartum fetal monitoring.)

J. D. H. Mahony

Cervical gonorrhoea in women using different methods of contraception


Cultures were made from the cervix, rectum, and oropharynx of 1929 women to determine the prevalence of gonorrhoea. For patients of similar race and age, the rates of cervical gonorrhoea among users of oral contraceptives (10-6/100) or intrauterine device users (9-5/100) were significantly greater than observed with patients using barrier methods, condom-diaphragm-foam (1-7/100). On the other hand, there were no significant differences in rates of rectal or oral infection by method of contraception. Postpartum patients were found to have similar infection rates at all three sites as a comparable group of non-puerperas. Recommendation for utilisation of barrier methods are made for suitable patients, including those in the immediate puerperium.

Authors’ summary

Untreated endocervical gonorrhoea and endometritis following elective abortion


The aim of this study was to evaluate the influence of untreated endocervical gonorrhoea on the development of endometritis after therapeutic abortion. Endometritis was defined as the occurrence of any condition for which the patient required antibiotic therapy within four weeks of the abortion, when other conditions such as urinary tract infections had been excluded. The data obtained from 228 patients with endometritis were analysed by the method of matched pairs. Of patients with gonorrhoea 14-7% developed endometritis, and it was shown that there was a threefold increased risk of endometritis in patients with gonorrhoea, when compared with a control group.

A. McMillan

Alternative pathway complement activation: A possible mechanism inducing skin lesions in benign gonococcal sepsis


In an attempt to elucidate the pathogenesis of the skin lesions in benign gonococcal sepsis, the authors studied two cases. The first female presented with classical skin and joint lesions of gonococcal sepsis and *Neisseria gonorrhoeae* was identified from the genital tract. The gonococcal complement-fixation test was negative before and after treatment with 10 megaunits of benzylpenicillin by intravenous injection daily for eight days.

An early skin lesion was studied by direct immunofluorescence and showed deposits of C3 around and within the capillaries and basement membrane. No specific IgG, IgM, IgA, or C4 deposits could be demonstrated. A mature skin lesion showed a histopathological picture identical with that of ‘allergic vasculitis’.

Similar findings were made in the second patient but *N. gonorrhoeae* could not be identified in the genital tract because of earlier antibiotic treatment.

A complex pathway is suggested for the pathogenesis of gonococcal skin lesions in which complement is activated by gonococcal endotoxic lipopolysaccharide, through the alternative pathway, without the participation of immune complexes.

For proof of the suggested alternative pathway complement activation in gonococcal sepsis, the authors propose investigation for properdin and C3 proactivator on early skin lesions and consider that the results and conclusions from their cases could be a starting point for the re-examination of the mechanisms involved in so-called ‘superficial allergic vasculitis’. While describing only one confirmed case, the paper has merit in suggesting mechanisms involved in the development of skin lesions in benign gonococcal sepsicaemia which will need further investigation.

Barbara L. Morgan

Asymptomatic gonorrhoea and pregnancy


Gonorrhoea (Microbiology)

Immunological and serological diversity of *Neisseria gonorrhoeae*: immunotyping of gonococci by cross-protection in guinea-pig subcutaneous chambers


The subcutaneous chamber model is here used by its originator to identify gonococcal immunotypes in vivo. Guinea-pigs were first immunised systemically with virulent strains, then cross-challenged with graduated numbers of organisms inoculated into the chambers from the same isolates. Resistance was measured by culture of chamber fluid. Four cross-protection immunotypes were present among the nine strains that were used.

Brian Evans

Immunological and serological diversity of *Neisseria gonorrhoeae*: gonococcal serotypes and their relationship with immunotypes


This work arises from the need for a more practical system of typing clinical isolates than the guinea-pig subcutaneous chamber model. Serum bactericidal activity was found to correlate with subcutaneous chamber cross-protection, but agglutinating activity correlated poorly and seemed most influenced by the presence of pili. Bactericidal activity was also influenced by other factors, including the source of complement, the concentration of test antigen and complement activity, and the presence of calcium and magnesium ions and bovine albumin in diluent.

Brian Evans
Serogrouping of Neisseria gonorrhoeae:
Identification of four immunologically distinct acidic polysaccharides.
Journal of Infectious Diseases, 134, 377-383.

A series of population-specific acidic polysaccharides have been described that can be used as a basis for serogrouping Neisseria gonorrhoeae. These polysaccharides have been designated Gc antigens, and four immunologically distinct types have been identified. With these purified serogroup antigens and appropriately absorbed antisera in haemagglutination-inhibition systems, four typing systems have been established. Their sensitivities for purified homologous antigens range from 16 to 1 μg/ml. Purified heterologous antigens fail to inhibit at concentrations of 1000 μg/ml. Clinically isolated N. gonorrhoeae are incorporated into these systems by conversion to standardised crude Gc antigen extracts by alkaline hydrolysis. Of the 163 strains studied, 83% could be typed; 85% of these were typed for only one serogroup. Twenty strains were typed for two serogroups, and reisolation studies demonstrated that these strains were mosaics rather than mixed cultures. Four strains from each serogroup were selected, and antisera and purified serogroup antigens were produced from them. These were identical with their respective standard serogroup antigens and antisera in haemagglutination-inhibition and immunodiffusion systems.

Author’s summary

Quantitation of serum antibodies to surface antigens of Neisseria gonorrhoeae with radiolabeled protein A of Staphylococcus aureus.
Journal of Infectious Diseases, 134, 317-323.

Antibodies in human sera against surface antigens of Neisseria gonorrhoeae were detected with use of 125 I-labelled protein A from Staphylococcus aureus. Serum was allowed to react with a suspension of whole gonococci, and the antibodies attached to the bacteria were quantitated with protein A, which reacts with the Fc fragment of IgG. Tests with five human sera with a gonococcal complement-fixation titre of >1:30 revealed no difference between use of freshly isolated gonococci and use of strains subcultured daily on artificial medium for 10 years. Antibodies cross-reacting with N. gonorrhoeae and Neisseria meningitidis were found in human sera. The results of the test with labelled protein A varied with the serum titre of complement-fixing antibody to N. gonorrhoeae. Acute and convalescent sera from six of seven patients, including one with disseminated gonococcal infection, showed significantly larger differences in antibodies to N. gonorrhoeae than did sera of women without evidence of genital infection. Complement-fixation titres changed significantly in only three of the six patients.

Authors’ summary

Influence of surface charge on attachment of Neisseria gonorrhoeae to human cells.

Isoelectric focusing showed that Neisseria gonorrhoeae has an overall negative surface charge. Chemical modification of protein amino or carboxyl groups changed the surface charge and thereby altered the ability of the organisms to attach to human amnion cells grown in tissue culture. Attachment of modified and unmodified N. gonorrhoeae was increased by the presence of pili only when the bacteria bore a negative surface charge. Thus an important factor in the pathogenesis of gonorrhoea may be the ability of pili to facilitate attachment of N. gonorrhoeae by overcoming the initial electrostatic repulsive barrier which exists between it and the host cell.

Authors’ summary

Preliminary studies in the clinical use of a bicarbonate containing growth medium for Neisseria gonorrhoeae.
Journal of the American Venereal Disease Association, 3, 40-42.

Inhibition of growth of N. gonorrhoeae by bacterial interference.

Gonorrhoea (Therapy)

Changing penicillin resistance of the gonococcus in Thailand
Journal of the American Venereal Disease Association, 3, 32-34.

Treatment of acute and subacute gonococcal urethritis with fosfomycin
Chemotherapy, 23, Supplement 1, 293-300.

National gonorrhoea therapy monitoring study: Adverse drug reactions

Non-specific genital infection

Re-evaluation of the role of T-mycoplasmas in nongonococcal urethritis

T-mycoplasmas have been associated with non-gonococcal urethritis (NGU) in studies in which these organisms were found to be more prevalent among men with NGU than among control groups of men. In none of these studies was the group matched for sexual experience, a variable which we have shown to be an important determinant of colonisation with T-mycoplasmas. We obtained urethral cultures for genital mycoplasmas from men presenting to the Boston City Hospital with gonococcal urethritis and with NGU, and from men of comparable sexual experience who did not have urethritis. Colonisation with T-mycoplasmas was no more prevalent among the men who had NGU than among those men who did not have urethritis. These data raise some serious questions about the role of T-mycoplasmas in nongonococcal urethritis.

Authors’ summary
The effect of penicillin on genital strains of Chlamydia trachomatis in tissue culture


The growth in McCoy cell tissue culture of strains of Chlamydia trachomatis recently isolated from genital infections was examined quantitatively after incubation with benzylpenicillin. An extracellular concentration of 0-1 unit/ml throughout incubation prevented the development of normal fluorescent chlamydial inclusions, but even at high concentration (100 units/ml) abnormal non-fluorescent inclusions developed. Erythromycin, chloramphenicol, and tetracycline inhibited the growth of the organism without producing abnormal inclusions. The effect of delayed addition of penicillin or its removal during incubation was investigated. The possible nature of the abnormal inclusions resulting from exposure to penicillin is discussed.

Authors' summary

Chlamydiae as agents of sexually transmitted diseases


T-strain mycoplasma in human genital tract infections


Candidosis

Indirect immunofluorescence assay for antibody to germ tube of Candida albicans—a new diagnostic test


This test is based on evident differences between the blastospore phase of Candida albicans and the mycelial phase associated with infection. Comparison of the agglutination assay (using blastospore suspension) was made with indirect immunofluorescent techniques using blastospore (IF-B) and germ tube (IF-T) preparations. Sera from 27 subjects were studied, 14 were from patients with C. albicans infections proved by repeated culture (source not stated) and 13 from normal individuals (used as controls). Results confirmed that antibody titres obtained by all three methods were increased significantly in the infected subjects, but were most marked against germ tubes of C. albicans.

B. M. Partridge

Vaginal candidiasis: Its diagnosis and relation to urinary infection


Genital herpes

Herpes virus type 2 encephalitis in two neonates from the same household


Neonatal herpes simplex virus (HSV) is rare. This report from McGill University describes two full-term infants who were born within a month of each other to mothers who lived in the same commune during their pregnancies. Both infants developed severe HSV2 infection shortly after birth; one survived, although with widespread central nervous system (CNS) involvement, while the other died with overwhelming CNS infection. HSV2 was recovered from both infants. The first mother showed cervical intranuclear inclusions and a rising titre of HSV antibodies; she gave a history of a vesicular eruption on the genitals two weeks before delivery. The second mother was apparently not investigated, but she had had a febrile illness shortly before delivery.

The authors speculate that the two mothers may have become infected with HSV2 from a common sexual partner within the commune at some time during the third trimester. (Contact tracing was not attempted).

J. D. Oriel

Reactivation of herpes simplex virus infection by ultraviolet light and possible involvement of prostaglandins


Four-week-old mice, latently infected with HSV, were used as laboratory models to study the mechanisms of latency of HSV. Latent infections were established in the mice by inoculation of HSV type I intradurally into the right ear. Reactivation of the infection at the site of inoculation was attempted with immunosuppressive drugs (prednisone, cortisone, and cyclophosphamide), by irradiating the site of initial inoculation with ultraviolet (UV) light, or by inoculating the site with prostaglandin E2 (PGE2) or phosphate buffered saline (PBSA). Immunosuppression did not cause reactivation, but infectious virus was recovered from the ears two to three days after either UV irradiation, or injection of PGE2 or PBSA. HSV was consistently recovered from only about one-quarter of the mice tested.

To explain both these results and recurrent labial herpes in man, the authors postulate that herpetic reactivation occurs when the skin rather than the dorsal root ganglion harbouring the virus is stimulated. They suggest that during a latent infection small quantities of virus reach the skin from the infected ganglion forming subclinical microfocus of infection, and that macroscopic lesions develop (that is, reactivation occurs) when conditions in the skin favour virus multiplication.

Shirley J. Richmond

Effect of neutral red and light on Herpesvirus hominis type 1 in cell culture


Various concentrations of neutral red were added to monolayers of muscle-skin fibroblasts after adsorption of Herpesvirus hominis type 1. The concentration necessary to reduce plaque counts was found to be 10×10−5.3 mol/l. At the same time, the minimal toxic concentration of neutral red for muscle-skin fibroblasts was determined by the concentration that reduced the plaques of a challenge virus, vesicular stomatitis virus, that was applied after treatment with neutral red.
Abstracts

Vulvar histology after neutral red photoinactivation of herpes simplex virus
E. G. Friedrich Jr., R. H. Kaufman, P. J. Lynch, and J. D. Woodruff (1976), Obstetrics and Gynecology, 48, 564–570

The use of photodynamic dye and light inactivation for the treatment of genital herpes simplex virus infections has been associated with the risk of potential oncogenesis. Sixteen patients treated with neutral red and fluorescent light for documented herpes infections were studied at intervals ranging from nine to 52 months after treatment. Four patients treated with other modalities were included in the study. Biopsies of the treated areas were obtained, and 3925 tissue sections were examined. Mild atypical epithelial changes were focally present in most specimens regardless of therapy. Histologically identifiable premalignant change could not be demonstrated.

Authors' summary

Recurrent genital Herpes simplex virus (HSV) infection of guinea pigs
M. Scriba (1976). Medical Microbiology and Immunology, 162, 201–208

Other sexually transmitted diseases

Molluscum contagiosum—A defective poxvirus?

Purified preparations of molluscum contagiosum virus contain a DNA-dependent RNA polymerase (EC 2.7.7.6) with similar but not identical properties to those of the enzyme found in vaccinia virions. The ultraviolet inactivation kinetics of the RNA polymerase from both viruses were similar, displaying fast and slow components. Ultraviolet irradiation destroyed the interfering capacities of molluscum and inactivated vaccinia virions, and the interferon-inducing capacity of molluscum virus slowly and with first-order kinetics. Inactivation studies of the interferon-inducing capacity of vaccinia virus were complicated by cytopathic effects. Electron microscopical studies showed all stages of virus growth in vaccinia-infected mouse embryo cells; molluscum virus appeared to be degraded in lysosome-like bodies. In preliminary studies, marked changes in cytoplasmic RNA synthesis and in patterns of polypeptide synthesis were found in vaccinia-infected but not in molluscum-infected mouse embryo cells.

Authors' summary

Granuloma inguinale simulating advanced pelvic cancer

Public health and social aspects

Sociopsychiatric characteristics of clinic patrons with repeat gonorrhoea infections

Social aspects of venereal disease aboard a U.S. Navy destroyer

Miscellaneous

Epidemiologic characteristics of women infected with Corynebacterium vaginale (Haemophilus vaginalis)

In a group of 184 women infected with Corynebacterium vaginale (Haemophilus vaginalis) 34% over the age of 30 years were divorced or separated and 8% gave a history of induced abortion. Fifty-one per cent were taking an oral contraceptive drug, as compared to 36% of 140 women in a control group. Various sexually transmitted diseases were diagnosed either concomitantly or at another time in 52% of women in the study group and 38% of those in the control group. The rate of cervical neoplasia (invasive carcinoma in situ, and dysplasia) was 13.6% in the study group and 5.7% in the control group, the rate in the study group being several times that in the general population. These and other available epidemiological data support the conclusion that C. vaginal is transmitted sexually.

Authors' summary

Herpes simplex virus type 2 and cancer of the prostate

Among the evidence which supports a viral cause for cervical carcinoma is the presence of antibodies to herpes simplex virus type 2 (HSV2) in significantly more women with cervical cancer than in controls. In this paper from the Department of Urology, Columbia-Presbyterian Medical Center, New York, the authors have sought similar association between HSV2 and carcinoma of the prostate.

The study group consisted of 28 patients with untreated carcinoma of the prostate and the control group of 20 patients with benign prostatic hypertrophy. Serum was collected from each patient and antibodies against HSV1 and HSV2 were measured by the microcomplement fixation test, a reciprocal titre of 8 or more being regarded as positive.

Authors' summary
A randomized comparative trial of the performance of the Ayre and the Armovical cervical spatulate
British Journal of Obstetrics and Gynaecology, 83, 981–985

The Ayre and the Armour Pharmaceutical Co. Ltd cervical spatulae were compared in a randomised trial on 982 women of childbearing age. It was found that the Armovical spatula was slightly less effective than the Ayre spatula in obtaining adequate numbers of squamous cells. The Armovical spatula was, however, far better at providing a sample of endocervical or metaplastic cells and, as a result, yielded a substantially higher proportion of 'satisfactory' smears (54% as against 39%). Red blood cells were more often present in smears taken with the Armovical spatula than with the Ayre spatula. Although the data in the present study were too few to prove that the Armovical spatula is better than the Ayre spatula at detecting cellular abnormalities, it seems likely that this is so.

Authors' summary

The Jarisch-Herxheimer reaction
(Leading Article) (1977).
Lancer, 1, 340–341

Quantitative microflora of vagina
M. E. LEVISON, L. C. CORMAN,
American Journal of Obstetrics and Gynecology, 127, 80–85s

The problems of the venereal diseases in general practice
H. FOX (1976).
Practitioner, 217, 746–752

Venereal disease and the homosexual
Practitioner, 217, 741–745

Cervical bacterial flora in women fitted with a copper-releasing intra-uterine contraceptive device (IUD)
(Turku, Finland)

Conference on sexually transmitted diseases (22 papers on various topics) (1976). Bulletin of the New York Academy of Medicine, 52, 855