

corrected by the Whitby and Hynes method and in four cases corrected by the Wintrobe method readings were obtained agreeing better with the clinical course than those obtained by the Westergren technique.

Discussion

It has already been noted by Whitby and Hynes (1938) that the Wintrobe correction for sedimentation rates contains certain fallacies—i.e., that above certain figures the corrected rate is higher than the volume of packed cells, and that below certain volumes of packed cells sedimentation rates cannot be abnormal. Their own correction curve, like that of Wintrobe, is derived from estimations of rates in certain abnormal cases in which the blood was subsequently manipulated to conform to normal haematocrit readings, the final figures being controlled by a group of rates observed in an equivalent number of healthy students. It appears, however, from this investigation that these corrections rob the estimation of the sedimentation rate of its value. The corrected figures in the Wintrobe series often produced a series of readings which was so variable that in nearly half the cases the figures did not appear to conform to any pattern at all. The correction devised by Whitby and Hynes so levelled out the unevenness commonly found in sedimentation readings, and the estimations included so many readings in the "doubtfully" or "slightly" raised categories, that again no pattern suggesting improvement or deterioration could be detected.

Beaumont and Maycock (1935) made a plea for the increased employment of the Westergren method as being superior to two other methods then in use, and stressed the point that useful information could be obtained only by adopting the same method in serial readings. Bailey (1941) compared the Wintrobe method with the Westergren in a series of 131 cases, and reached the conclusion that the corrected rate was of little use in classifying the patient's clinical status and was misleading in a considerable proportion of cases. Davis (1946) in a general review of the clinical use of sedimentation-rate estimations advocates the Westergren technique. My findings support the opinion that the Westergren method, as generally used, gives figures for the sedimentation rate that agree better with the course of the patient's illness, estimated by prolonged clinical observation, than do the present methods that employ corrections.

Summary

A study of the erythrocyte sedimentation rates of 61 female patients suffering from pulmonary tuberculosis is reported. A comparison was made between the clinical course of the illness on the one hand and the sedimentation rates as estimated by the methods of Westergren, Wintrobe, and Whitby and Hynes on the other. The Westergren method appeared to be the most useful both in estimating the degree of activity of the disease and in indicating the direction of its progress.

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ERYTHROCYTE SEDIMENTATION RATE THE EFFECT OF ALCOHOL AS CONTAMINANT

BY

W. O. SYKES, M.Sc.

Biochemist to the Royal Sheffield Infirmary and Hospital

Schött (1928) described the effect of alcohol on the erythrocyte sedimentation rate (E.S.R.). Very small additions of alcohol in the form of drops of different dilutions in ether usually caused an increase in the one-hour sedimentation reading, while larger additions reversed the tendency and resulted finally in very reduced values. The alcohol present in venepuncture needles which had been stored in spirit was sufficient to cause large discrepancies in the results of E.S.R. determinations.

Famulari and Colacresi (1935) studied the effect of intragastrically administered alcohol on the E.S.R. They found a great diminution in the E.S.R. following the administration, but they did not examine the effects obtained by the addition to blood *in vitro* of similar proportions of alcohol to those obtained *in vivo*.

Schött's observations seem to have escaped general notice, and the purpose of this note is to draw attention to the phenomenon and its technical implications.

The Test

Sedimentation-rate determinations were performed on blood from patients with and without the addition of various proportions of industrial methylated spirit *B.P.*, hereinafter referred to as "spirit." The blood was heparinized, 5 to 6 ml. of blood being added to 0.05 ml. of heparin solution (50 international units). One-millilitre samples of the heparinized blood were taken into test-tubes and each was mixed with 0.25 ml. of 3.8% sodium citrate solution. To the mixtures were then added 0.01, 0.02, 0.03, and 0.04 ml. of spirit respectively, a control tube having no spirit added. It will be noted that this procedure does not exactly reproduce the conditions of practice, where the blood would be contaminated with spirit before the citration. One-hour sedimentation values of the mixtures were determined in Westergren pipettes, care being taken to obtain thorough mixing and to ensure that the pipettes were clean, vertical, and not exposed to direct sunlight or draughts. The determinations for each patient were started together, and always within three hours of taking the blood.

A progressive diminution in sedimentation, preceded in some cases by a slight increase, was observed in the presence of increasing amounts of spirit. The results in 30 cases are shown in the Table. With the exception of Cases 29 and 30 (investigated at 19° and 17° C. respectively), corrections of the E.S.R. for the temperatures of the determinations have been made from an empirical chart (*Laboratory Digest*, January, 1946). Slight haemolysis was observed with Cases 4, 5, and 10 in the mixtures containing the higher concentrations of spirit.

Whether the depressant effect of spirit can constitute a considerable source of unreliability in E.S.R. determinations depends on the possible degree of contamination of blood samples. The "residual contents" of Record-type syringes of various capacities, complete with needles, were estimated as follows, detaching the needles only during expulsion of liquids.

Aqueous dye solution (T 1824) was drawn into the syringe to capacity and expelled. After sucking in and expelling air one

to three times, water was drawn in to capacity and expelled, as dilute dye solution, into a measuring cylinder. The dilute dye, after making up to a measured volume, was compared

Table showing the Effect of Increasing Concentrations of Spirit on the E.S.R. (mm./1 hr.)

| Case No. | Amount of Spirit in 1.25 ml. of Citrated Blood | | | | |
|----------|--|----------|----------|----------|----------|
| | 0 | 0.01 ml. | 0.02 ml. | 0.03 ml. | 0.04 ml. |
| 1 | 1 | 2 | 1 | 1 | 1 |
| 2 | 4 | 3 | 3 | 2 | 2 |
| 3 | 5 | 6 | 5 | 3 | 1 |
| 4 | 6 | 8 | 5 | 2 | 1 |
| 5 | 9 | 6 | 2 | 2 | 1 |
| 6 | 10 | 13 | 11 | 5 | 2 |
| 7 | 13 | 9 | 4 | 2 | 2 |
| 8 | 15 | 13 | 11 | 6 | 3 |
| 9 | 17 | 18 | 13 | 9 | 4 |
| 10 | 18 | 14 | 12 | 7 | 2 |
| 11 | 23 | 19 | 13 | 6 | 3 |
| 12 | 25 | 20 | 14 | 5 | 2 |
| 13 | 26 | 28 | 24 | 21 | 11 |
| 14 | 26 | 19 | 6 | 3 | 1 |
| 15 | 29 | 21 | 6 | 4 | 3 |
| 16 | 30 | 25 | 18 | 12 | 7 |
| 17 | 32 | 24 | 14 | 6 | 3 |
| 18 | 34 | 30 | 22 | 12 | 5 |
| 19 | 36 | 32 | 25 | 7 | 4 |
| 20 | 42 | 35 | 14 | 6 | 3 |
| 21 | 54 | 42 | 18 | 7 | 2 |
| 22 | 64 | 59 | 40 | 24 | 14 |
| 23 | 64 | 52 | 22 | 5 | 4 |
| 24 | 67 | 69 | 62 | 44 | 13 |
| 25 | 74 | 75 | 70 | 57 | 38 |
| 26 | 78 | 77 | 53 | 29 | 12 |
| 27 | 86 | 86 | 78 | 53 | 26 |
| 28 | 94 | 91 | 74 | 47 | 26 |
| 29 | 120 | 112 | 102 | 85 | 42 |
| 30 | 128 | 126 | 126 | 86 | 43 |

colorimetrically with an appropriate dilution of the original dye. A simple calculation gave the residual contents of the syringe with needle. Three syringes of each size were examined, two determinations being made on each syringe, with the following results :

| Size of Syringe | Range of Residual Volume |
|-----------------|--------------------------|
| 20 ml. | 0.1 to 0.4 ml. |
| 10 ml. | 0.03 to 0.1 ml. |
| 5 ml. | 0.03 to 0.1 ml. |

The amount of blood usually taken from a patient for an E.S.R. determination varies from 2 to 6 ml., and thus a specimen taken in a syringe which has been stored in spirit and used without adequate rinsing may well be contaminated with 2% of spirit. This degree of contamination will render the determination of E.S.R. liable to gross error.

I am indebted to the physicians to the Royal Infirmary, Sheffield, for permission to use material from their cases. My thanks are due to Professor Krebs for his advice and interest, and to Dr. Weetch for the original suggestion and for his continued interest.

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As a result of experiments aimed at increasing the efficiency of the tuberculin test applied to dairy cattle an alternative procedure to save the time and labour of both farmer and veterinary surgeon has been introduced. In recent years the test used has required two injections. From experiments carried out on nearly 10,000 cattle there has been evolved a single injection test which the Tuberculosis Committee of the Agricultural Research Council are satisfied is as effective as the double one. The Secretary of State for Scotland has therefore modified the directions given in 1929 on the manner of carrying out the tuberculin test of an animal for the purposes of the Milk (Special Designations) Orders (Scotland) 1936-44. The test may now be made either by the double intradermal method as hitherto or by the method of the single intradermal comparative test. The experiments showed a close similarity between the results yielded by the two tests. In attested and tuberculin-tested herds the single intradermal test gave the more accurate result in the few discrepant cases that occurred.

Medical Memoranda

Calciferol in Tuberculous Peritonitis with Disseminated Tuberculosis

While the value of calciferol in the treatment of lupus vulgaris is now established, reports of its use in other tuberculous conditions, with the exception of adenitis, are few. No claims can be made for a preparation after its apparently successful use in an isolated instance, but the dramatic improvement in the following case renders it worthy of record.

CASE REPORT

On July 8, 1946, a girl aged 19 was admitted to hospital with a lung infiltration of an exudative character in the right mid-zone with no expectoration. This lesion, which was not then diagnosed as being tuberculous, had not resolved when she was discharged from hospital a month later. She did not attend as an out-patient as instructed, and stayed at home until May 5, 1947, when she was admitted to hospital with acute abdominal pain and signs suggestive of tuberculous peritonitis. A subsequent laparotomy showed free fluid in the peritoneal cavity and studding of the peritoneum with numerous tubercles; the diagnosis was confirmed by microscopical section.

On July 3 she was transferred to a sanatorium, but her condition deteriorated steadily; renal and vesical tuberculosis were diagnosed. Intravenous pyelography showed changes of the renal calices consistent with tuberculosis of the kidney, and cystoscopy revealed tuberculous granulations in the bladder. Moreover, tubercle bacilli were found in the urine on repeated investigations. The laparotomy wound, which had broken down a month after operation, showed no sign of healing. On Sept. 22 she was transferred to hospital as no longer suitable for sanatorium treatment and came under our observation for the first time.

On admission she was extremely pale and wasted; the laparotomy wound was discharging freely and she suffered from severe abdominal pain and tenderness, especially in the right loin, and frequency of micturition. She had a high swinging temperature ranging from 97 to 102° F. (36.1 to 38.9° C.) and appeared to be going downhill rapidly, and the prognosis was considered to be extremely grave. This state of affairs persisted for two months. On Nov. 19, in view of the grave nature of her condition, it was felt that as a last resort treatment with high-potency "ostelin" (Glaxo) might be worthy of trial, and we decided, her blood chemistry being normal, to give her 100,000 i.u. daily. Within seven days the temperature became normal, and at the end of 14 days the abdominal pain had completely subsided and the laparotomy wound had healed. No toxic manifestations were observed. Owing to the renal condition the drug was discontinued for 14 days; then another 14-day course was given. Since then steady progress has been maintained; the patient remains afebrile, her appetite has improved, and her weight increased from 4 st. 12 lb. to 6 st. (30.84 to 38.1 kg.). No tubercle bacilli can now be demonstrated in repeated examinations of the urine. The lung lesion, which has shown a slow but steady tendency towards resolution throughout, is now almost completely healed. It has never been associated with the expectoration of sputum.

The very marked improvement in which the appearance of the patient changed from that of a moribund case of tuberculosis to one of returning health and vitality we feel cannot be dissociated from the administration of the calciferol. It is suggested that the treatment of similar lesions under controlled conditions with this preparation is worthy of more extensive trial.

PHILIP ELLMAN, M.D., F.R.C.P.,
Consulting Physician
K. H. ANDERSON, M.B.,
House-physician.

Tuberculosis Department,
St. Stephen's Hospital,
London County Council.

Recent Advances in Public Health, by J. L. Burn (J. and A. Churchill, 25s.), is an informative and interesting book on many aspects of public health not discussed in the ordinary textbook—for example, problem families, care of the cerebral palsied child, the care of the premature infant, municipal foot health services, road safety, human-milk bureaux. Dr. Burn does not refer to marriage guidance, which some consider to be complementary to child guidance and equally important to the mental health of the child. In other sections he considers the latest contributions to the solution of old problems, notably water purification and air-borne infections. The sections on handicapped children will be found most informative. The book should be widely read by public-health officers wishing to keep themselves up to date and can be recommended to D.P.H. students.