

DIAGNOSTIC VALUE OF BLOOD STUDIES IN MALIGNANCY OF THE GASTROINTESTINAL TRACT

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THE present study was undertaken with the primary objective of developing data which might furnish a valuable diagnostic adjunct in uncovering malignant disease of the gastrointestinal tract. Thirty selected cases were examined, seventeen in males, thirteen in females. In two instances the cancer was in the small intestine, seven in the colon, two in the sigmoid, one in the rectum, and eighteen in the stomach. The majority of the patients were in the older age group, and a number of specimens were obtained from each patient. In Table 1 the blood count, differential count, sedimentation rate and platelet count are recorded.

Examination of the blood smears in these cases failed to reveal any hematologic features that were unusual or in any way diagnostic of the existing condition. The majority of the patients presented an essentially normal blood picture, although abnormal cells appeared occasionally. In both early and late stages of malignancy, no significant changes were noted, except in those cases in which extensive ulceration had occurred. In these cases a distinct leucocytosis was found. The platelet counts were within normal limits, since the normal value for platelets, according to most hematologists, ranges from 200,000 to 400,000. Only two counts rose above this figure.

It was evident, however, that the blood sedimentation rate was abnormal in all cases. Also, the two-hour period was more reliable and, therefore, conclusions were based on the second reading. In these determinations a rate of 10 mm. for men and 15 mm. for women was considered the upper limit of normal. Lipp and Aaron¹ adopt the following scale:

Sex	Normal	Borderline	Elevated
Male.....	1-10	11-15	21+
Female.....	1-15	16-20	26+

Inasmuch as the rate was faster in solutions of fibrinogen, and slower in solutions of albumin, according to Fahraeus,² Broom,³ and Lima and Brown,⁴ the tests were also made with albumin. But in all of the experiments, the author found no change in the sedimentation rate; the results were the same as those obtained when the Cutler technique was employed.

In this series, as has been repeatedly noticed by other investigators, the analysis of the blood showed no striking characteristics. As Edwards⁵ points out, if we assume the blood count to be an index of a patient's fitness, we may be sadly deceived. In many of the inoperable cases the red count and hemoglobin may remain rather high, or at least average normal:

"In a man of 49 with an inoperable growth, the red count was 6,560,000 and the hemoglobin 104 per cent, and in a woman with an inoperable growth it was 6,100,000 with 92 per cent hemoglobin. In fact, changes in the blood picture in cases of cancer usually differ very little from those of peptic ulcer."

The increase in the sedimentation rate, however, was of some significance, since it indicated that a disease of some kind was present. In 1927, Rubin⁶ examined the blood sedimentation reaction in 127 cases of cancer and found this medium a better guide to the condition of the patient than the temperature chart. The progress of the disease was accompanied

by an increased sedimentation rate, although cachexia tended to retard it. The test, however, had no value in differential diagnosis because of its non-specificity and because early cancer produced little of malignant disease. Further study has reemphasized the fact that blood taken from a person suffering from cancer assumes a different picture from that taken from a normal person. After as-

TABLE I
GASTROINTESTINAL MALIGNANCY

Sex	Age	Site	Hemoglobin (Säili) Per Cent	Erythrocytes	Leucocytes	Neutrophiles	Small Lymph.	Large Lymph.	Sedimentation		Platelets (thousands)
									1 H.	2 H.	
M	39	Sigmoid	85	4.65	6,000	67	30	3	18	24	285
F	62	Colon	60	3.75	6,000	65	33	2	18	26	240
M	66	Stomach	60	3.70	10,600	68	30	2	20	28	245
F	62	Colon	50	3.25	9,000	74	25	1	26	34	240
F	58	Colon	70	3.60	8,000	65	33	2	24	30	265
F	53	Colon	70	3.60	7,800	66	33	1	21	29	300
F	78	Stomach	55	3.25	11,200	74	24	2	22	28	220
M	70	Stomach	80	4.65	6,200	68	25	7	24	30	240
M	73	Colon	55	3.55	11,000	86	12	2	24	32	250
M	61	Stomach	45	2.16	9,000	62	32	6	22	32	210
M	52	Intestine	70	3.85	20,000	94	6	0	18	24	280
F	72	Stomach	70	3.85	6,000	64	35	1	21	28	325
F	84	Stomach	75	4.50	12,000	76	21	3	24	32	400
M	64	Intestine	80	4.30	15,000	84	12	4	28	34	450
F	87	Stomach	50	2.75	7,000	78	20	2	22	30	340
M	51	Colon	50	3.50	11,600	80	18	2	24	28	290
F	72	Stomach	50	3.00	6,000	45	50	5	18	26	375
M	62	Stomach	80	4.30	11,000	85	12	3	16	24	400
M	68	Stomach	55	3.25	8,200	80	16	4	18	26	340
M	68	Stomach	50	3.50	24,000	90	5	5	20	28	300
M	73	Colon	75	4.25	13,000	90	8	2	24	28	370
M	71	Stomach	65	3.90	13,200	82	14	4	18	24	300
F	69	Stomach	40	3.15	12,000	85	10	5	18	22	290
M	70	Stomach	80	4.50	6,400	74	25	1	20	26	320
F	47	Sigmoid	60	3.25	7,400	60	35	5	24	32	375
F	67	Stomach	75	4.25	8,000	80	10	10	22	26	325
M	41	Stomach	70	4.10	7,200	72	25	3	18	26	300
M	70	Stomach	70	4.00	11,000	78	20	2	21	26	280
F	82	Stomach	80	4.50	19,400	90	5	5	22	26	300
M	59	Rectum	60	3.50	8,300	82	15	3	18	26	420

alteration in the velocity. It was noted that strictly normal sedimentation values were extremely rare in the presence of definitely diagnosed cancer. This is ascribed to physiochemical changes in the blood plasma and to the progressive anemia in cancer patients.

None of the factors listed above are specific for cancer. Therefore, we are forced to rely mainly upon the blood pattern, as described in a previously published article,⁷ to reveal the presence

of malignant disease. Further study has reemphasized the fact that blood taken from a person suffering from cancer assumes a different picture from that taken from a normal person. After as-

sembling many additional blood slides in conjunction with the clinical picture, it has now become possible to recognize a definite new pattern, that of beginning malignancy. In preparing the drops of blood on the glass slide, lightness of touch is essential; for if the drops so acquired are too thick, no pattern is discernible. When the blood has dried satisfactorily, the pattern formed is a sensitive indicator and can be used at intervals to determine the course of the

