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Abstract

Neomyographic examinations were made by the authors on 28 patients. The extent of reconvalescence was measured on the basis of changes in the values recorded by the myograms taken before and after the treatment.

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EVALUATION OF DR. SZIRMAI'S METHOD OF TREATING THROMBOSIS WITH NEOMYOGRAMS RESP. NEOMYOGRAPHS

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Aetiology, diagnosis and therapy of thrombosis have been treated of in a number of publications. There are, however, many unknown factors left over in connection with the problem of the origin of this disease. Some research workers suggest the influence of meteorlogic and cosmic circumstances as its origin. Others (e.g. OCHSNER) stress the importance of smoking and trauma and the vasospasmodic effects to be responsible. TROSSEAU and his collaborators point out the part played by tuberculosis and cancer, BURKE emphaszes heredity and constitution as the determining factors. As a matter of fact, we have no satisfactory solution for this problem up to the present, in spite of both research work and scientific observations being carried on with a persistent endeavour adequate to the importance of the disease. Besides the simple methods depending on the external symptoms of thrombosis (changes of temperature, colour of the skin, etc.) we succeeded in clearing up the microscopic, physical and colloid-chemical conditions of the coagulating process with the aid of more sensitive apparatuses. We know about the fine structure of the blood-disks, their disposition for pseudopody and coagulation. We also know that prothrombin, thrombin and thrombokinase are coagulating and anti-thrombin and antikinase are inhibiting factors. We know that coagulating factors are combined with globulin, that inhibitory factors are combined with albumins. We know that heparin develops in the special cells+ of the reticulo-endothelial system, not in the hepatic cellules, etc.

Aetiological research has naturally led to the corresponding changes or modifications of therapy. The discovery of the anticoagulants (heparin and dicumarol) marks a considerable progress in this field. Experiments had been going on for a long time to make use of anticoagulants, such as hirudin, sodium oxalate and sodium citrate. They did not, however, stand the test because of the toxic symptoms caused when given in higher doses. The discovery of heparin described by MCLEAN in 1916 and put to use by CRADFORD was of revolutionary importance. Then dicumarol was added to the list by LINK in

+ "Ehrlichsche Mastzelle"

1940, and this (with its derivatives) proved to be an effective though not a harmless means for fighting thrombosis. In addition, RAPPERT was the first to describe, in 1952, a treatment of thrombotic cases with hydergineqanthesis.

Besides these simple procedures the clinician is aided in establishing a diagnosis or in controlling the ensuinganti coagulant treatment by the LÖWENBERG test as well as by the macro-and microhaematological examination methods of QUICK (1), SOULIER (2), SZIRMAI (3, 4). SZIRMAI's examinatinations by means of the myograph present a novelty in registering thrombophlebitis resp. thrombosis in the lower extremities.

As it is well known, circulation in the extremities as a rule is not fully arrested by the thrombi of the vessels, as the collateral tracks generally remain active. The fact should not, however, be ignored that, in such cases, collateral function also is disturbed by contraction occurring through reflex courses. According to the grade of collateral capacity, symptoms may vary considerably. In addition to the external symptoms of thrombosis (changes in temperature and colour of the skin), the respective musculature generally feels slack as a result of the decrease of blood supply in the motor nerves. Under certain circumstances musculature falls into a state of ataxic weakness and even a complete motoric ataxy may occur. (7)

In cases of other diseases we have already been able to register with the myograph changes in the values of contraction and tonus resulting from insufficient blood circulation.

Our actual examinations had the purpose to state whether, by means of Szirmai's neomyograph (Fig. 7) an apparatus far more sensitive than the myograph the results of our anticoagulating treatment could be registered, independently from the subjective feelings of our patients, on the mere basis of the changes in the tonus and contraction values of the muscles. Therefore, besides physical examination methods, we observed prothrombin activity and made a myogram with each patient before starting the actual treatment. During the anticoagulating treatment itself we have concentrated our attention on prothrombin activity and have made another myogram when the cure was completed.

According to the respective prothrombin level of our patients, we started the anticoagulating treatment with administering thromasal pills containing phenylindandiona product of the Pharmaceutical Factory Asal+. The treatment was continued by local and peroral administration of vasodilators until objective and subjective symptoms disappeared.

Above examinations have been executed on 28 patients. Results are summed up in Table 1.

+ We herewith wish to express our gratitude to the Pharmaceutical Factory Asal, Berlin, for granting the use of Thromasal pills for our research purposes.

Table 1.

Name	Diagosis	Prothrombin-activity before and after treatment %		Neomyogram in myotons before and after treatment		Result of therapy
H. T.	Thrombosis cruris l. sin.	127	66	1.5	11.0	good
K. S.	Thrombophlebitis l. sin.	109	74	2.0	10.0	good
K. K.	Thrombosis cruris l. d.	110	58	1.0	9.0	satisfactory
T. K.	Thrombosis cruris l. sin.	120	80	3.5	12.0	good
I. J.	St. p. Thrombosis cruris	106	60	2.0	10.0	go od
Gy. S.	St. p. Thrombophlebitis	119	72	1.0	10.5	good
K. A.	Thrombosis cruris l. utr.	138	86	0.5	8.5	satisfactory
I. G.	St. p. Thrombosis cruris	103	56	0.5	6.0	bad
A. T.	Thrombophlebitis cruris l. d.	108	70	2.0	13.0	good
B. P.	St. p. Thrombosis cruris l. sin	114	80	0.5	11.5	good
R. S.	St. p. Thrombosis cruris l. d.	107	74	1.5	10.5	good
L. A.	Thrombosis cruris l. d.	129	73	2.5	9.5	satisfactory
G. S.	St. p. Thrombophlebitis l. sin.	106	40	0.5	8.5	satisfactory
T. M.	Thrombohlebitis cruris l. d.	112	48	3.0	11.5	good
M. L.	Thrombosis cruris l. sin.	105	63	3.0	10.5	good
M. S.	St. p. Thrombophlebitis l. d.	109	68	2.0	7.5	bad
F. B.	St. p. Thrombosis cruris l. d.	119	60	1.5	10.5	good
Cs. S.	Ulcus cruris	107	75	1.0	6.5	bad
D. T.	Thrombosis cruris	112	66	1.5	9.6	satisfactory
B. H.	Ulcus cruris	106	68	0.5	6.0	bad
N. J.	Thrombosis cruris	109	55	1.5	7.0	bad
M. Cs.	Thrombosis cruris	121	72	2.5	11.0	good
O. S.	St. p. Thrombophlebitis	136	62	3.0	6.5	bad
S. J.	Thrombosis cruris	103	54	2.5	10.0	good
Ty. A.	Thrombosis st. p. partem	105	63	1.0	6.5	bad
V. T.	Thrombosis cruris	102	48	1.5	6.0	bad
Sz. M.	Thrombosis cruris	107	60	2.5	10.0	good
Gy. B.	Thrombosis cruris	117	76	3.0	11.0	good

Table I. shows that, under a pressure of 30 myotons applied on our patients before starting the treatment, the amplitudes of the myograms generally give values of 1—2 myotons (1 myoton = 1mm), 3 myotons rarely. Contrary to these, in normal cases under similar conditions amplitudes of 10 to 12 myotons are recorded. We may observe further, that as a result of the treatment, control examinations present a rise in myogram values in 20 of the examined cases, while in the remaining 8 cases postthrombotic syndromes and subjective complaints were observed at repeated examinations.

Our examinations have a double significance. They verify Szirmai's earlier examinations (5, 8, 9) registering influence of decreased circulation on musculature. Furthermore, an exact record is compiled on the cure of our patients.

Summing up the above, we may state that neomyographic examinations are along with the other mentioned methods very valuable in setting up diagnosis of thrombotic cases. The special advantage of the neomyograph shows in enabling us after the complaints of the patients have ceased and when blood coagulating factors are normalized to make exact measurements of the status of

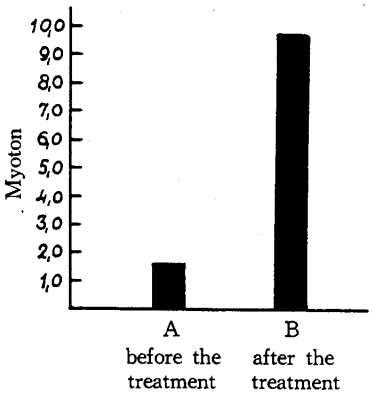

Fig. 1. Average results of changes of tonus-and contraction-values in 28 examined cases.

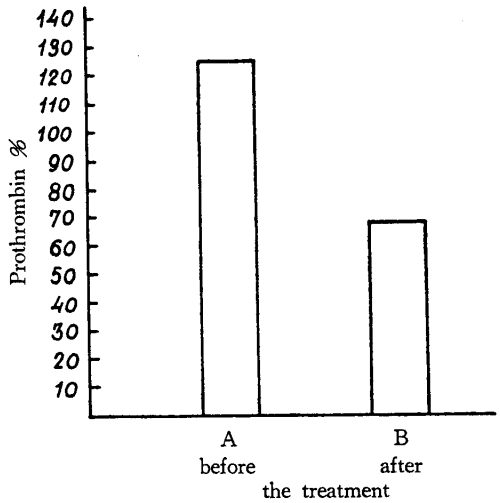

Fig. 2. Average percentage of prothrombin activity in 28 cases examined.

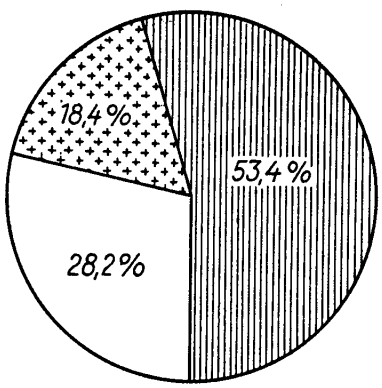

Fig. 3. Therapeutical results based on changes in the myogram-values expressed in percentages.

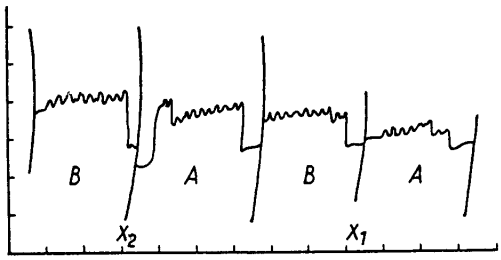

Fig. 4. Neomyogram, characteristic of a case of thrombosis in both lower extremites. Passive (A) as well as active (B) movements show equally small amplitudes. (To read from right to left)

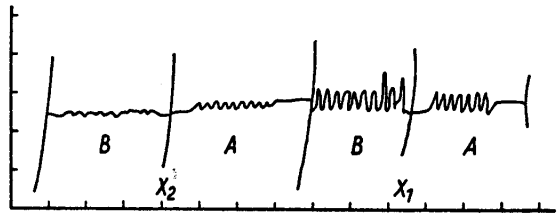

Fig. 5. a. Neomyogram, characteristic of a case of thrombosis in the right lower extremity (X_2). The left limb too shows a circulation worse than normal.

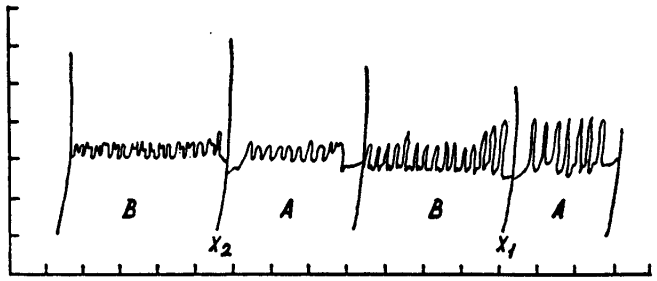

Fig. 5. b. After treatment in both limbs an essential improvement is observed, strikingly shown by the myogram taken before and that after the treatment.

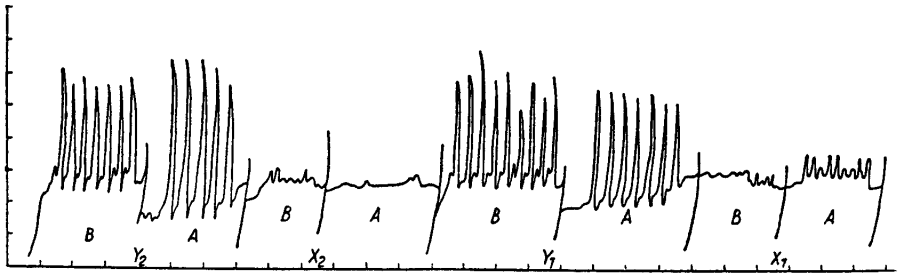

Fig. 6. An 8-year old thrombotic case with slight oedema in the left lower and a distinct one in the right lower limb resulting a restriction of the movement. This myogram shows clearly that the active (B) movements of the left limb (X_1) are severely confined, while the values of the right limb (X_2) are in the case of passive (A) as well as active (B) movements about 0.

the disease by registering tonus and contraction changes resulting from the improvement of circulation in the musculature.

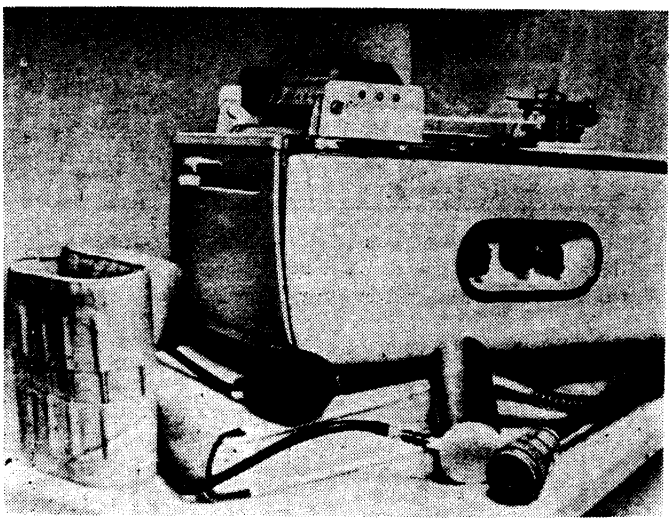

Fig. 7. Szirmai's Neomyograph

SUMMARY

Neomyographic examinations were made by the authors on 28 patients. The extent of reconvalescence was measured on the basis of changes in the values recorded by the myograms taken before and after the treatment.

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