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TESTING OF BRAIN-STEM FUNCTION IN 134 PATIENTS COMPLAINING OF IMPOTENCE

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To determine the cause of brain-stem dysfunction for impotence, we studied the brain-stem function in 134 patients complaining of impotence and compared the results with their clinical records, erectile function tests, a papaverine test, dynamic cavernography and measurement of the penile brachial index. We found brain-stem dysfunction in 43% of the patients with impotence. Brain-stem dysfunctions tended to show characteristic differences in underlying disease and erectile dysfunction. We discuss the testing and direct treatment of the brain-stem dysfunction, and postulate it to be one cause of the impotence.

Key words: Cause of impotence, Brain-stem function, Erectile function test, Clinical study

The central nerve system controls penile erection as well as sexual behavior in general. Some diseases of the central nerve system such as temporal epilepsia, head injuries, and pituitary tumors cause impotence. Although it is easy to determine the cause of impotence in men with these diseases as organic, such cases are rare. Furthermore, diagnostic methods to detect asymptomatic abnormalities of the higher sexual center have not progressed.

In 1945, Mason[1] reported that headaches and vertigo were linked with the genesis of impotence. Elsewhere, vertigo has been described as the result of brain-stem dysfunction which in turn was diagnosed by a test of central equilibrium. We performed these central equilibrium tests on patients suffering from impotence but without headaches and vertigo. The results revealed that some of the men with impotence had brain-stem dysfunction.

MATERIALS AND METHOD

Two hundred thirty nine patients complaining of impotence visited the Department of Urology in the Takamatsu Red Cross Hospital between January 1981 and December 1985. A test of equilibrium as a measure of brain-stem function[2] was performed on 134 patients who agreed to receive the test.

An optokinetic nystagmus test (OKN), an eye tracking test (ETT), a blindfolded vertical writing test (BWT) and a righting reflex test (RRT) were employed. OKN is a method of recording the spontaneous nystagmus at the time of eye movement. There is a reduced nystagmus frequeny in the abnormal type (Fig. 1). ETT is a procedure for recording the movement of the eyeballs when the eyes are tracking a moving target. In the abnormal pattern, the primary wave form produces a step-like pattern, and the differential wave form shows a saw-tooth pattern due to saccardic pursuit (Fig. 2). BWT is a test where the subjects are asked to write their names with eyes open and closed before and after administration of adrenaline. In the abnormal pattern, there are axis deviations and tremors of the signature (Fig. 3). RRT is a method of recording deviations from a vertical postural axis when subjects are asked to stand up straight for one minute, first with eyes open, and then eyes

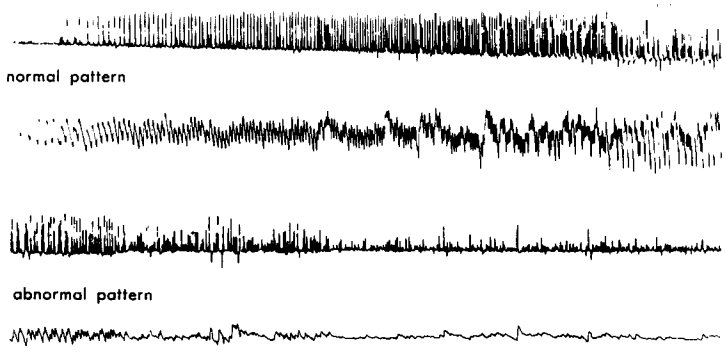

Fig. 1. Optokinetic nystagmus test.

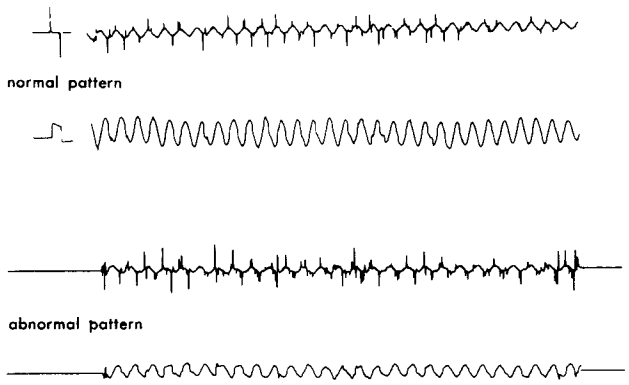

Fig. 2. Eye tracking test.

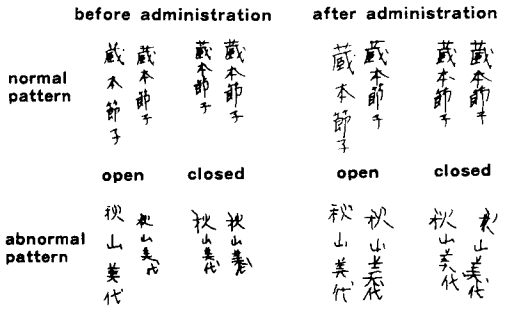

Fig. 3. Blindfolded vertical writing test.

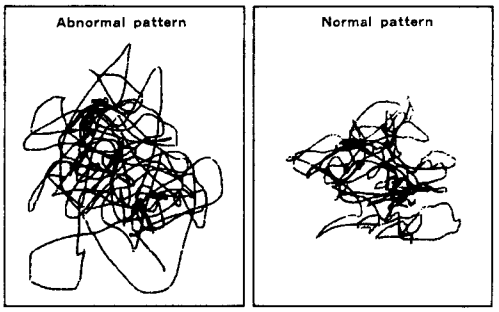

Fig. 4. Righting reflex test.

closed. Abnormal types tend to sway far from the central axis (Fig. 4).

The subjects were divided into three groups according to the test results: One or more abnormal findings (Group A), no abnormalities (Group B), and no test performed Group C, control. There were 58 patients (43% of 134 impotents) in Group A, 76 (57%) in Group B, and 105 in Group C.

Age, primary impotence or secondary impotence, underlying disease, and serum testosteron and prolactine levels were compared across the 3 groups. Most members of Groups A and B, and some cases from Group C underwent tests for erectile function using nocturnal penile tumescence monitoring (NPT), and monitoring of psychogenic erection after audio visual sexual stimulation (AVSS). Results were compared across the 3 groups. Some patients also underwent a papaverine test, dynamic cavernography, and measurement of penile brachial index (PBI).

The results of NPT and AVSS were clas-

sified as "functional", "functional-suspected", "organic-suspected" and "organic" using the criteria of our clinic[3,4].

RESULTS

Ages ranged from 19 to 78 years old (amean of 47.3 years) in Group A, from 25 to 77 (42.6) in Group B and from 21 to 82 (46.0) in group C, respectively. There was no significat difference among the 3 groups. The ratio of primary impotence to secondary impotence was 0.14 in Group A, 0.57 in B and 0.31 in C respectively. There was a lower incidence of primary impotence in Group A as compared with Group B or C. Among the underlying diseases, the incidence of diabetes mellitus and psychiatric diseases was significantly higher in Group A, but there were no significant differences in the incidence of any other underlying disease among the 3 groups (Table 1).

Of the 58 patients in Group A, 16 were classified as "functional", 11 were classified as "functional-suspected", 16 were classified as "organic-suspected", 8 were classified as "organic" and 3 were not classified by the erectile function test. The test was not done in 4 patients of Group A. Of the 76 patients in Group B, 26 were classified as "functional", 23 were classified as "functional-suspected", 9 were classified as "organic suspected", 7 were classified as "organic" and 3 were not classified. The test was not performed in 8 patients of Group B. In Group C, an erectile function test was performed on only 37 of the 105 patients. Seventeen patients were classified as "functional", 7 were classified as "functional-suspected", 5 were classified as "organic-suspected", 4 were classified as "organic" and 4 were not classified. The incidence of "organic" or "organic-suspected" was higher in Group A than in B (Table 2).

A papaverine test was performed on 18 patients in Group A, 21 in Group B and 10 in Group C. Full erection was seen in 8 patients of Group A, 5 of Group B and 3 of Group C. Tumescence only without rigidity was seen in 4 patients of Group A, 5 of Group B and 4 of Group C. Change only rarely or not at all was seen of 6 patients in Group A, 11 of Group B and 3 of Group C.

Of the patients undergoing PBI, all of the 13 patients in Group A, 8 of the 12 patients in Group B and 4 of the 6 patients in Group C had a normal value of 0.70 or more.

Findings from the dynamic cavernography showed abnormality of the venous system in 11 of the 16 patients in Group A, 13 of 20 in Group B and 5 of 7 in Group C.

These tests were performed on too small a sample of patients to obtain a clear correlation. However, the results are indicative of a correlation between brainstem dysfunction and PBI. Further studies are necessary to determine the correlation between brainstem dysfunction and these findings (Table 3).

Table 1. Age distribution, incidence of primary impotence and underlying disease.

	A (n=58)	B (n=76)	C (n=105)
Age	47.3(19–78)	42.6(25–77)	46.0(21–82)
Primary/Secondary	0.14	0.57	0.31
Underlying desease			
diabetes	0.22	0.07	0.09
trauma & post-op	0.18	0.11	0.15
spinal & cerebral	0.03	0.04	0.06
elderly (>70)	0.03	0.04	0.04
drugs	0.00	0.02	0.07
other organic	0.00	0.07	0.01
psychiatric	0.08	0.03	0.02
prostatism	0.03	0.02	0.02

A = brain-stem dysfunctional B = normal C = control

Table 2. Findings of erectile function test.

	A	B	C
functional	16	26	17
functional suspected	11	23	7
organic suspected	16	9	5
organic	8	7	4
not classified	3	3	4
not done	4	8	68

Table 3. Findings of other test.

	A	B	C
Papaverine test			
full erection	8	5	3
tumescence only	4	5	4
no change	6	11	3
PBI			
>=0.70	13	8	4
< 0.70	0	4	2
Dynamic cavernography			
normal	5	7	2
abnormal	11	13	5

COMMENTS

The results of this study revealed that 43% of the patients with impotence showed brain-stem dysfunction. The incidence of diabetes mellitus and psychiatric disease was high among underlying diseases, and first coital failure incidence was low in patients with brain-stem dysfunction. There was a higher tendency for brain-stem dysfunctional patients to have abnormal erectile function test findings.

However, some questions may arise from these results. Is the brain-stem dysfunction a direct cause of impotence? How does the brain-stem act on erectile and sexual behaviour? Did the testing truly detect the brain-stem function? It is difficult to answer these questions at the present time.

We have no current method for measuring brain-stem function directly, but can detect abnormalities there though manifestations of disequilibrium in eye or hand movements or standing posture.

Although it is not confirmed how the brain-stem acts on erection and how to detect its function, we postulate that the brain-stem is a higher sexual center controlling erections. Accordingly we have been trying to treat brain-stem dysfunction directly as reported[5] previously in the Japanese Journal of Impotence and showing brain-stem dysfunction on our equilibrium test were administered Meclofenoxate, a brain-stem stimulant. The treatment was effective in 13 patients, ineffective in 9, and 3 dropped out. Although it is necessary for the drug to be evaluated by a carefully designed therapeutic program in the future, meclofenoxate hydrochloride seems to be a drug from which we can expect good efficacy in the treatment of impotent with brain-stem dysfunction.

The present findings support our postulation that brain-stem dysfunction is a direct cause of impotence and that testing for equilibrium is a useful means of detecting brainstem dysfunction.

In conclusion, we found brain-stem dysfunction in 43% of 134 patients with impotence. Brain-stem dysfunctionals tended to show characteristic differences in underlying disease, and erectile dysfunction. We postulate that brain-stem dysfunction is one cause of impotence, and testing and direct treatment of the brain-stem dysfunction is useful for patients with impotence.

REFERENCES

1) Mason I: Headaches and vertigo and their correlation to derengement of sexual function. Ohio State Med J **41**: 132~134, 1945
2) Maebayashi K and Imagawa A: The diagnosis of impotence, Report 2. On the observation of disorder in hypothalamus brain-stem system. Jpn J Urol **71**: 1390~1397, 1980
3) Akazawa S: The diagnosis of impotence, Report 4. Criteria for assesment of nocturnal penile tumescence. Jpn J Urol **75**: 1415~1422, 1984
4) Kawanishi Y and Imagawa A: The diagnosis of impotence, Examination of impotence with recording physiological reaction for sexual stimulation. Jpn J Urol **77**: 1421~1428, 1986
5) Imagawa A and Kawanishi Y: Meclofenoxate in treatment of patients with impotence. Impotence **1**: 9~16

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和文抄録

インポテンスを主訴とする134例の脳幹機能の検討

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香川征・黒川一男

インポテンスを訴える患者134例に視運動性眼振検査，視標追跡試験，重心動揺試験，アドレナリン負荷書字試験による脳幹機能検査を施行した．43%の患者に脳幹機能障害を認めたが，脳幹機能障害を有する群と正常群の間には基礎疾患として精神病，糖尿病を認めたが，勃起機能検査などとの相関は認められなかった．脳幹機能障害がインポテンスの原因であるか否かについて検討し，脳幹機能障害はインポテンスの一つの原因であり，脳幹機能障害に対する直接の治療が有効であるとの考えを述べた．