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著者	HARIU TOHRU, OHTSUKI KATSUKO
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# APPLICATION OF HYPNOSIS TO E.E.G. EXAMINATION OF A CHILD

By

TOHRU H A R I U (針生 亨) and KATSUKO O H T S U K I (大槻克子)

*(Mental Hygiene Clinic of Miyagi Prefecture)*

*(Child Guidance Center of Miyagi Prefecture)*

In the clinical diagnostic use of E.E.G. it is important for the subject to shut his eyes and lie down quietly during the data are recorded. But most of children can not understand the meaning of the E.E.G. examination, and are lacking in motivation and also have anxiety or fear to the examining situation. Accordingly they reject the examination or show remarkably unstable behaviors.

In order to overcome these difficulties, it was attempted to apply the hypnosis for the examining procedure. As the result this attempt proved to be very advantageous. The percentages of success were affected by the difference of induction techniques used and careers of hypnotic training on the part of operators. It seems, however, almost everybody can apply this techniques easily by a little training. To make hypnosis practically more useful for E.E.G. examination of a child, the standardization of induction procedure should be studied hereafter.

In the clinical diagnostic use of E.E.G., it is important, to begin with, to record the data while the subject is lying down quietly with his eyes shut. But in the case of a child, especially showing behavior-disorder, some following difficulties occur:

1) Most of children can not understand the meaning of the examination and they are also lacking in motivation of undergoing the examination.

2) Children are attacked with anxiety and fear in entering the examining room (shield room) and in having electrodes stuck on their head. In the room where shield wire-net is disclosed, their nervous tension is more increased. Consequently some of them attempt to escape or behave furiously. Sometimes we have to give up the examination when these children scratch off the electrodes already stuck on.

3) Excitement of the children in the examining situation accelerates their sweating and leads to a disadvantageous condition of E.E.G. recording.

4) Most of children get soon tired. They can not lie down continuously and keep quiet, but move their body.

5) Their attentions are easily distracted by outer noises.

These also make it impossible to get a favorable E.E.G. record.

In order to remove these difficulties two devices have been attempted.

One is to control the environmental conditions of examining settings. For example, to hide wire net of shield room by pleasantly looking clothes, to shut out the irrelevant noise, to prepare toys etc. . . . . But not all children are motivated or made quiet by these devices.

Another device is to use narcotics. This method has advantages in being administered to all children (irrespective of ages, unmotivated, or behavior-disordered) without so hard training, but on the other hand we may meet with the following shortcomings;

- i. By this method the subjects easily fall asleep, and the E.E.G. in their sleeping state can be well recorded, while it is difficult to get their E.E.G. record in the waking state.
- ii. Spindle phase is too long. The drowsy state that appears before shifting to the spindle phase is very instantaneous. Its diagnostic value is much reduced. Even if E.E.G. has already shown the spindle phase, it takes much time for this phase to disappear.
- iii. Continuous effects of narcotics (temporal intoxication and motor disturbance after the examination) prevent the subjects from returning home soon after the examination.

In order to avoid such difficulties as mentioned above, the authors tried to apply hypnosis as third devices. This method proves to be very promising as shown by the investigation below mentioned.

#### METHOD

*Subjects:* Fifty-six children of ages ranging from two years and eleven months to fifteen years, who visited our clinic. Their intelligence was not below a border line. These children were divided into three groups.

- a) Eleven children of ages ranging from two years and eleven months to twelve years and three months, nine boys and two girls, who enabled us to record the data in natural state without using any narcotics or hypnotic induction. These subjects were all cooperative and therefore any artificial means were not necessary for them.
- b) Twenty-nine children of ages ranging from five years and seven months to fourteen years and ten months, twenty boys and nine girls, to whom hypnotic induction was attempted.
- c) Sixteen children of ages ranging from three years and five months to fifteen years, thirteen boys and three girls, to whom narcotics were administered.

*Procedure of E.E.G. recording:* It was used as E.E.G. equipment NIHON-KODEN ME 91 D TYPE. E.E.G. were inducted mono-and bipolarly from the skin of subjects' head.

*Operators of hypnotic induction:* Four psychologists and one psychiatrist in our clinic were charged with this experiment. Our careers of hypnotic induction were as follows; Operator A has been in charged with our clinic for longer than five years and is well trained in hypnotic induction.

Operator B has twenty cases of induction in half a month with operator A's help.

Operator C and operator D have some knowledges about hypnosis but have not any practical training.

Operator E has not any knowledge or practice of hypnotic induction.

*Induction procedure:* The hypnotic induction was not limited to some specific



Fig. 1. a subject in the stage of hypnotic induction.



Fig. 2. a subject in the stage of hypontic sleep.

procedures. The operators can choose their favorite techniques by cases. For example, deep respiration, relaxation of muscle, body sway, gazing at one point, drwosiness etc. . . were suggested case by case. To the subjects who resist induction, counter suggestions were given. We found it very advantageous to carry out hypnotic induction while we are sticking the electrodes on the subject's head one by one. For this procedure saves time and can remove some unnatural interruption of hypnotic induction caused by sticking the electrodes. The following is an example of hypnotic induction; "Now

Table 1

	Ss	Sex	Age	I.Q.	Success or Failure of induction	Operators	E.E.G. C/S			Diagnosis of E.E.G.
							Normal Awake	Hypnotic Induction	Hypnotic Sleep	
1	K.S.	M	5: 7	161	Succ.	C	8~9	8	5~6	Brain Damage
2	A.K.	M	6: 1	55	Succ.	B	7~8	7~8	6	Epilepsy
3	U.Y.	F	7: 1	126	Succ.	C	8	8~10	6	
4	T.M.	M	7: 2	112	Succ.	A	/	6~7	4~5	
5	A.J.	M	7: 3	103	Succ.	A	/	8	δ	Epilepsy
6	Y.K.	M	7: 6	50	Fail. after Succ.	A	/	7~8	5	Epilepsy
7	G.M.	F	7: 8	88	Succ.	A	/	8~9	5~6	Epilepsy
8	K.H.	M	8: 1	82	Succ.	D	8~9	9	6~7→δ (sharp wave)	Epilepsy
9	M.S.	M	8: 6	139	Succ.	A	/	8	5	
10	H.Y.	M	8: 6	96	Succ.	B	/	5	7~14	
11	K.M.	M	8:11	120	Succ.	B	10	10~11	8~9	
12	U.S.	F	9: 0	126	Fail.	E	9	10~11	/	
13	K.S.	M	9: 4	82	Succ.	A	/	10	6~7	
14	S.H.	M	9: 7	77	Succ. after Fail.	E	8~10	8~9~10	7~12	
15	A.S.	M	9: 8	78	Succ.	B	9	7	7~δ	Epilepsy
16	W.R.	F	9:11	80	Succ.	A	/	10	7	Epilepsy
17	S.S.	M	10: 7	117	Succ.	A	10	9	6~8	
18	K.M.	F	10: 9	78	Succ. after Fail.	E	10	10~11	6	
19	K.S.	M	11: 6	82	Succ.	A	/	8~9	6~7	
20	I.K.	M	11: 9	98	Succ.	A	/	9	4	
21	I.K.	(another day induction)			Succ.	A	/	δ	δ	
22	Ch.E.	F	12: 2	97	Fail.	E	8~9	10	/	
23	K.H.	M	13: 0	55	Fail.	A	/	11	/	
24	K.M.	M	13: 2	76	Fail.	C	10	10~11	/	
25	O.K.	M	13: 6	90	Succ.	C	10	7~8	7~8	Brain Damage
26	N.N.	F	13:10	102	Succ.	C	10	10	10~12*	Epilepsy
27	S.K.	F	14: 3	70	Succ.	A	/	10	3~δ	Epilepsy
28	M.T.	M	14: 8	123	Succ.	A	/	9	δ	Brain Damage
29	O.Y.	M	14:10	107	Fail.	C	10~11	10~11	9~10	

you are gradually getting sleepy, very sleepy. While I stick this (electrodes) on your head one by one you become sleepy, very sleepy until you fall asleep! . . . . . You feel your hands and legs dull and heavy . . . . . You feel very heavy and dull . . . . . You become very sleepy . . . . . But don't fall asleep yet ! . . . . Please be patient not to drop off to sleep, before you are permitted to . . . . You are very sleepy now. . . . . You are in a drowys state . . . . You almost fall asleep . . . . You are now drowsy and feel somewhat pleasant. . . .”

### RESULT

#### 1. On the percentages of success in hypnotic method.

Twenty two of the twenty nine subjects were inducted and it was possible to record their data in a good condition. (Table 1. and Table 2.)

There were differences of the success rate in hypnotic induction among operators. Operator A succeeded in 90% of the subjects while operator E in zero %. As shown in table 2. the career of practice in hypnotic induction seems to have a very improtant effect on success. But the result of operator B teaches us that skill acquired by a little training in induction improves the induction very promptly.

Table 2. Success or Failure of hypnotic induction

Operator	A	B	C	D	E	Total
Success	13	4	4	1	0	22
Failure	1	0	2	1	3	7

#### 2. On the economy of time.

We computed a ratio of the waiting time till optimal condition for data recording appears and the available time for examination in each subject.

$$Q = \frac{\text{Waiting time}}{\text{Available time}}$$

The low Q value means that the proportion of waiting time and available time is small and the examination was efficiently undergone. Table 3. shows the comparison among three groups, natural, narcotic and hypnotic groups.

The Q value of narcotic group was very high in comparison with other two groups (4.45 of Q vaule in average). The Q value of hypnotic group was lower than that of natural group. From these comparison the hypnotic method proved to be the economical one in the time required for examination.

#### 3. Usefulness of this method for unstable, behavior-disordered children

As shown in table 1, for some children who were diagnosed to be epilepsy or brain damage and whose behavior in the examining situation was unusually unstable, our

Table 3.

Natural group				Hypnotic group				Narcotic group			
Subject	Age	Sex	Q	Subject	Age	Sex	Q	Subject	Age	sex	Q
N.M.	2:11	m	0.75	K.S.	5:7	m	0.50	O.R.	3: 5	f	1.20
S.M.	3: 8	f	3.20	A.K.	6:1	m	0.68	S.T.	3: 6	m	2.90
Y.H.	4: 6	m	1.20	U.U.	7:1	f	0.91	K.M.	3: 8	f	12.30
S.K.	4:10	m	0.74	K.H.	8:1	m	0.60	O.H.	3: 8	m	20.90
S.M.	7: 0	m	1.00	H.U.	8:6	m	1.30	I.S.	5: 3	m	2.87
G.Z.	7: 1	m	0.65	K.M.	8:11	m	1.20	S.R.	6: 0	f	10.00
S.M.	7:10	m	0.90	K.S.	9:4	m	0.56	T.K.	6: 0	m	2.20
O.A.	10: 6	m	2.85	S.H.	9:7	m	1.22	I.H.	6: 6	m	4.00
A.Y.	11: 7	m	0.62	A.S.	9:8	m	0.50	T.K.	6:10	m	10.30
K.T.	12: 3	m	0.90	S.H.	10:7	m	0.55	T.H.	7: 5	m	2.10
O.U.	12: 3	f	0.90	K.E.	10:9	f	2.50	M.K.	7:10	m	4.10
				I.K.	11:9	m	0.50	T.M.	7:11	m	2.60
				O.K.	13:6	m	0.87	A.M.	8: 7	m	7.90
								S.Y.	9: 6	m	5.20
								T.N.	9:10	m	2.00
								M.K.	15: 0	m	1.09
Mean			1.24	Mean			0.91	Mean			4.55

hypnotic method was very effective. In these cases, hitherto, it was considered to be difficult to make them quiet without the aid of narcotics.

The case 7 in table 1. was a girl of seven years and eight months. She was introduced to our clinic from the department of pediatrics of Tohoku University Hospital on account of her unusual unsteadiness and violent resistance to the examination. In this child even narcotic method was not successful. Under hypnotic condition she became soon quiet and it was possible to lead her to optimal condition for the examination.

The case 16 was a girl of nine years and eleven months. She showed hard resistance to us and was accompanied by her nurse. Hypnotic induction were tried on her. At first she resisted our induction furiously but soon after she was isolated from her nurse she became very quiet and responded positively to the induction.

4. Most of children complain of pain when the bandages for striking the electrodes were ripped off. Some of them even cry with pain. Hypnotic suggestions, however,

were very effective in removing these pains.

5. Some of narcotic group complain of unpleasant feeling of drowsiness after the examination, while hypnotic group did not have such after-effect. Some of them felt rather refreshed by post hypnotic suggestion.

6. The characteristics of E.E.G. pattern under the hypnotic procedures were investigated. In general there was a tendency to show alpha rhythm or slow wave.

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