# Periodic Psychosis in Adolescence

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## INTRODUCTION

"Periodic psychosis recurring in association with the menstrual cycle" is said to present marked psychotic symptoms concurrent with the menstrual cycle. The patients are said to repeat the menstrual cycle at least three times or more, fall into a state close to remission in the intermediate period of the menstrual cycle, and after a certain fixed period return to a mentally healthy state leaving behind no psychiatric symptoms such as personslity change (Endo et al.)[1].

As a characteristic of this disease, mention is made of its being often found in women in adolescence. As for psychiatric symptoms, there is often a mixture of the symptoms of manicdepressive psychosis and of schizophrenia. In this respect, the disease is regarded as one of the atypical psychoses (Takagi)[2]. It is a fact that the function of the endocrine system exerts a great influence on the fluctuations of symptoms in endogenous psychoses. However, there are many arguments as to the classification of this disease in the group of identified mental disease, and there also is the opinion that this disease can be considered to be an independent mental disease in itself (Aburai)[3].

Reports on this disease from American and European sources are limited; the report of Altschule et al.[4] is all that we know of. Recently, we encoutered one case considered to be a typical case of this disease, the details of which are reported here.

## CASE REPORT

Female, 17 years of age, 2nd year student of a senior high school.

Hereditary history: Not contributory.

Past history: Not remarkable except for a 15-day hospital treatment she received due to hemorrhagic cystitis at age 5.

Present illness: Her academic standing was above average throughout elementary, middle and high schools. By nature she is gentle, shy

and meek. She had rather few friends. She had menarche when she was 14 in the second year of junior high school, and her menses have since been regular.

From around the time she was a second-grader in junior high school, she would occasionally confine herself to her room, become reticent, and lie in bed without any sign of illness. When she was a first-grader in high school, she once played a record aloud at midnight, shouting, "I'm going to be an announcer!" These episodes subsided in several days and their relationship with menstruation is not clear.

The year she was 17, she had several restless day in April, and on May 13, she started talking so rapidly and the content of her talk was so incoherent that even her parents could not understand what she was talking about. This condition lasted till the 18th, which happened to coincide with the period of menstruation. From June 11, she became talkative again and started to speak ill of her friends. On the 13th, her menses came on. On June 16, she was diagnosed as "manic state" and admitted to the hospital.

In the ward she was restless and talked so much that her voice became hoarse. She would talk sometimes aloud and sometimes as if speaking to herself, saying such things as "I know all that others are thinking", "My classmates are speaking ill of me", "One of my teachers disregards me", "My family makes a fool of me", "A chair beside a bed resists me", and "The faucet dripping interferes with my thinking." Such condition lasted for 10 days, during which period she increased her appetite excessively, was liable to suffer sleeplessness and neurotropic drugs administered proved ineffective. Subsequent to this period, she became suddenly listless, showed a blank expression, became reticent and slow in action, and began to lie in bed at daytime complaining of drowsiness. However, a clear depressive mood was not observed.

This condition lasted till July 14. With that day as a turning point, she started presenting conditions shown previously in the hospital, that is, being over-sensitive to stimulation, hypermotility, talkativeness, lack of concentration, ideas of persecution, sleeplessness, and excessive increase of appetite. Her menstruation commenced on July 19. Observations were made on the clinical course for seven months thereafter in the hospital without administering any psychotropic drugs. From 4 to 5 days before commencement of menstruation, she rapidly fell into a state of elevated mood with a schizophrenic tendency which lasted about four days. And this followed by an apathetic state lasting about 14 days, which was repeated each time she had menstruation; however, this

Table 1. The results of examinationson the endocrine system

| | Premenstrual phase | Interval phase | Postmenstrual phase |
|---|---|---|---|
| Urine 17-KS (mg/dl) | 5.3- 7.3 | 5.3- 7.8 | 7.3- 8.8 |
| Urine 17-OHCS (mg/dl) | 3.9- 5.2 | 2.9- 5.0 | 3.9- 5.1 |
| Serum 11-OHCS (γ/dl) | 8.7- 13.5 | 10.2- 13.5 | 10.0-15.7 |
| Urine catecholamine (γ/day) | 80 -157 | 78 -159 | 75 -90 |
| Urine estrogen (γ/day) | 7.1- 7.2 | 1.3- 1.5 | 2.9- 5.4 |

psychiatric symptom became milder gradually. The symptoms became particularly mild when progesterone (20mg) was injected intramuscularly on October 16, and her menses followed four days later. From around that time, improvement in the cyclic psychiatric symptoms was accelerated markedly. In the meantime, examinations on the endocrine system were performed on several occasions, the results of which are as shown in Table 1.

On the LH-RH test in the follicular phase, there was a tendency for the response of LH to be high, but no greatly abnormal finding was found. Tests on peripheral blood and hepato-renal function, test on chromosomes and tests on cerebrospinal fluid showed no changes in particular.

Computed tomography of the brain was normal, but interesting findings were obtained with EEG. Near normal EEG findings were ob-

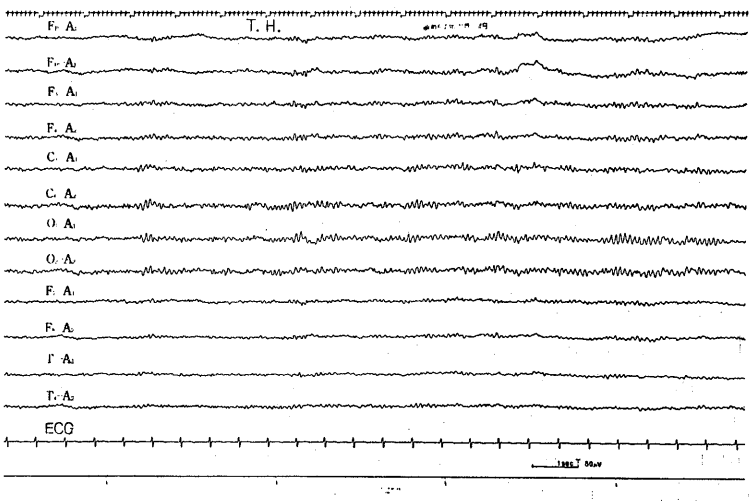


Fig. 1 EEG in the mood-elevated phase.

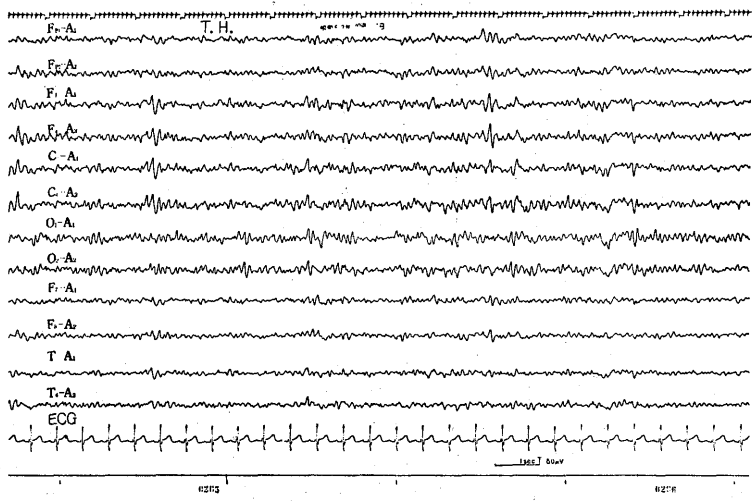


Fig. 2 EEG of the patient in an almost normal phase.

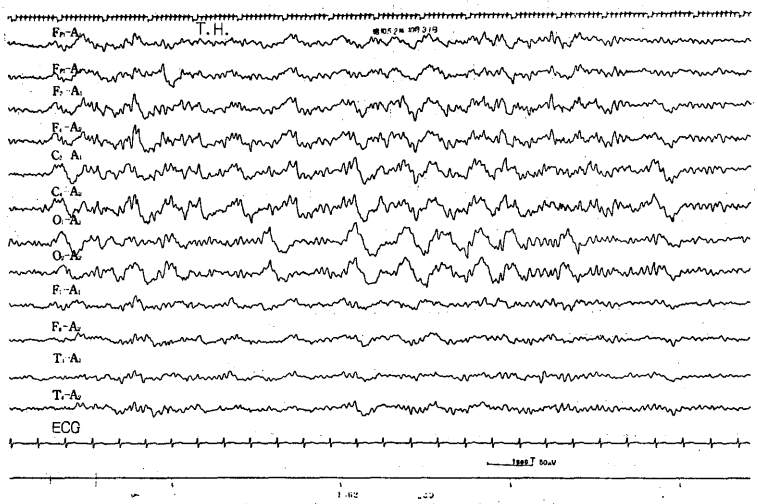


Fig. 3 EEG in the apathetic phase.

tained during the state of elevated mood (Fig. 1), but after the return to a normal mental state, a slow wave component began to appear (Fig. 2). There appeared slow wave bursts of 5-6 Hz in the apathetic state and "Mitten Pattern" in the sleep EEG (Fig. 3).

Clinical course after admission: She went into an elevated state almost coincidentally with the menstrual period. She also failed to respond to neurotropic drags, but returned to a calm state in about two

weeks. Subsequently, she went into an apathetic state, and then returned to the elevated state again in the next menstrual period. She repeated this clinical course with a one-month cycle six times.

With both the elevated states and apathetic states becoming milder, she was discharged in the 7th hospital month. Now attending the out-patient clinic, she is doing well and is almost completely stabilized mentally.

## DISCUSSION

A characteristic of this case was that the mentally elevated and apathetic states occured regularly, along with the sexual cycle. The patient rapidly went into a mentally elevated state starting several days before menstruation, retured to a nearly normal mental state some two weeks later, subsequently lapsed into as apathetic state, and returned to the mentally elevated state again immediately before the next menstruation.

Abnormalities in sexual hormones in the pathological phase have been reported in this syndrome (Endo et al.[1], Aburai[2], Hatotani et al.[5], Hatotani[6], Maeda[7]). Specifically, the abnormalities are connected with the hepatic function that deals with the metabolism of estrogen and androgens. The disruption "hepatocerebral-homeostasis"[2,5,7,8,9] is considered to be largely accountable for in the onset of this disease.

It was clear in this case that urine estrogen levels fell off with the aggravation of psychiatric symptoms, particularly in the mood-elevated phase and the apathetic phase, and became near normal with the remission of psychiatric symptoms. After intramuscular injection of progesterone, changes in mood decreased, but urine estrogene levels were still low. After admission, urine estrogen started showing low values not just in the pathological phase, but as symptoms were improving. In this respect, abnormality in urine estrogen cannot possibly be regarded as reflecting the true course of this disease.

There is a report that hyperestrogenism is shown in the pathological phase (Lingjaerde et al.[11], mall[12]). Since the LH-RH test showed no abnormality, the function of the hypothalamus-pituitary body system is considered to be within the normal range. The excretion of 17-KS and 17-OHCS was also measured on a time-course basis. Changes in values of these are not considered specific to this syndrome since they are found in shizophrenics as well[10].

It is known that slowing of and irregular changes in the basic EEG pattern along with the appearance of paroxysmal high-voltage slow waves

are typical in the EEG of patients with atypical psychoses. In the case presented here, there was a tendency for the EEG to appear normal when the psychiatric symptoms became aggravated, i.e., in the mood-elevated phase and the apathetic phase, and abnormal findings appeared on EEG when the patient was free of psychiatric symptoms. Kimura[13] observed a similar contradictory relationship between psychiatric symptoms and abnormal EEG - "seesaw phenomenon" - in two out of three patients with atypical psychoses. Regarding abnormal EEG findings in atypical psychoses, reversible functional abnormality or weakness of the diencephalon is suspected[1,13,14]. The "see-saw phenomenon" is considered to be a sign of diencephalon-pituitary body dysfunction[13].

In atypical psychoses, whether mental stress or psychogenic factors are present is often taken up for debate. Adolescence is a period in which one gropes for establishment of identity, and it is thought that mental stress and overwork could easily bring about a rapid fall in the mental level[15]. In the present case, however, existence of distinctive mental stress could not be identified.

Elucidation of whether abnormalities in the sexual hormone system or abnormal EEG findings could be related to the cause of the psychiatric symptoms in this case, or whether they are only phenomena of the disease still remain largely unknown, and much is left to future studies.

## SUMMARY

We have reported one case, aged 17 years, who repeated psychiatric symptoms concurrent with the menstrual cycle. She rapidly developed psychiatric symptoms immediately before menstruation and repeated the phasic cycle subsequent to a very short remission period in the intermenstrual phase. The psychiatric symptom immediately before menstruation was a manic state with a nuance of schizophrenia, and after the intermenstrual phase was an apathetic state.

Estrogen excretions in the urine were of low values in the pathological phase, particularly in the mood-elevated phase. EEG showed the so-called "see-saw" phenomenon with normal findings in the pathological phase and appearance of slow waves in the remission phase. After several pathological cycles repeated, the patient entered a complete remission state without leaving any traces of psychiatric symptoms, and has since had no recurrence.

## REFERENCES

1) Endo, M., Takahashi, S., Asano, Y. and Yamashita, I.: Periodic psychosis recurring in association with menstrual cycle. *Clin. Psychiat.*, 14 : 319-328, 1972. (in Japanese).

2) Takagi, R.: Periodic psychosis in preadolescence. *Psychiat. Neurol. Jap.*, 61 : 1194–1208, 1959. (in Japanese).
3) Aburai, K.: Periodic psychosis of puberty. *J. Clin. Psychiat.*, 5 : 1241–1252, 1976. (in Japanese).
4) Altschule, M.D. and Brem, J.: Periodic psychosis of puberty. *Am. J. Psychiat.*, 119 : 1176–1185, 1963.
5) Hatotani, N., Wakao, T., Yoshimoto., Takekoshi, A., Yoshimoto, K. and Hiramoto, K.: Psychophysiological studies on the atypical endogenous psychoses. (II) Endocrinological researches in the periodic psychoses. *Psychiat. Neurol. Jap.*, 61 : 855–870, 1959. (in Japanese).
6) Hatotani, N.: Clinico-biochemical studies on the atypical psychoses. – Endocrinological researches in the periodic psychoses–. *Clin. Psychiat.*, 3 : 1005–1016, 1961. (in Japanese).
7) Maeda, M.: Endocrinological studies on the female periodic psychoses. *Psychiat. Neurol. Jap.*, 62 : 1639–1660, 1960. (in Japanese).
8) Hatotani, N.: Psychophysiological studies on the atypical endogenous psychoses. (III) Endocrinological researches in the periodic psychoses. *Psychiat. Neurol. Jap.*, 64 : 29–43, 1962. (in Japanese).
9) Wada, T., Tanaka, Z., Sakurada, S. and Ogasawara, N.: Pathophysiological studies on atypical endogenous psychoses. Part 2. Endocrinological results due to Thorn's test, circulating eosinophile counts, urinary 17–KS and basal metabolic rate. *Psychiat. Neurol. Jap.*, 63 : 1233–1243, 1961. (in Japanese).
10) Yamashita, T., Nakazawa, A., Shinohara, S., Ito, K., Yoshimura, Y. and Morozi, T.: Changes in psychiatric state in connection with menstrual cycle of female mental patients. Part II. Case reports. *Clin. Psychiat.*, 4 : 725–731, 1961. (in Japanese).
11) Lingjaerde, P. and Bredland, R.: Hyperesterogenic psychosis. *Acta Psychiat. Neurol. Scand.*, 29 : 355–364, 1954.
12) Mall, G.: *On the hormonal treatment of pre and post-menstrual ovarian psychoses.* Grune & Stratton, New York, 1958.
13) Kimura, B.: Längsschnittliche Untersuchungen über Korrelation von EEG-Befunde mit klinischen Bildern atypischer endogener Psychosen. *Psychiat. Neurol. Jap.*, 69 : 1237–1259, 1967. (in Japanese).
14) Sato, T.: Pathophysiology of atypical endogeneous psychosis.*Psychiat. Neurol. Jap.*, 64 : 54–79, 1962.
15) Murakami, M.: Clinical observation on "degeneration-psychosis." *Psychiat. Neurol. Jap.*, 55: 22–36, 1953. (in Japanese).