

DISASTER PSYCHIATRIC SERVICE AT A GENERAL HOSPITAL FOLLOWING THE GREAT HANSHIN EARTHQUAKE

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Abstract: This report is a kind of empirical study on disaster psychiatric services following the Great Hanshin Earthquake.

Our work was performed at a general hospital (the Higashi-Kobe Hospital) located in the middle of the disaster area. Before the quake there were no psychiatric facilities at that hospital; nevertheless many patients with mental problems visited there. And our team, consisting of several volunteer psychiatrists from all over Japan and some nurses of that hospital, immediately set up psychiatric emergency service at the hospital, and started to work on Jan. 19, 1995. We report our experience and some findings through it.

We consulted 289 patients from Jan. 19, 1995 to Jan. 31, 1996. However in this report, we refer only to 204 outpatients that we saw during that period, with special reference to "disaster-related" cases.

There were 145 "disaster-related" cases and these "disaster-related" cases have still been appearing for a year after the disaster. The numbers of female patients was larger than that of males, and most of them were between 40 and 80 years old. Concerning psychopathological states, depressive and anxiety states were most often observed, and then PTSD (post-traumatic stress disorder) or PTSR (post-traumatic stress reaction) and acute psychotic state followed.

"Relatively severe psychiatric cases" were observed during the rather earlier period following the quake. On the other hand the number of "relatively mild cases" increased since the second month after the quake.

From our experience when a large city is hit by a catastrophic disaster, it is effective to set up psychiatric emergency services not only at public health centers or mental hospitals but also at general hospitals. Additionally, cooperation between psychiatric services and other medical services, such as internal medicine, surgery and so on, is very important and necessary in catastrophic conditions.

Index Terms

disaster psychiatry, earthquake, natural disaster, post-traumatic stress disorder, general hospital psychiatry

OBJECTIVES

We report several findings from our experience following this catastrophic disaster, the

Great Hanshin Earthquake.

Firstly, we will report about our psychiatric interventions, with special regard to the 204 outpatients we treated. We have been performing this work since Jan. 19, 1995, and we are still engaged in it (in Aug. 1996). This report presents some of our findings during the first year.

Secondly, we would like to report on the progression of various kinds of mental disorders that occurred in the first 9 weeks immediately after the disaster. From this investigation some important findings were derived on initial intervention in disasters.

Finally, we would like to recommend some kinds of psychiatric emergency services that are necessary following a catastrophic disaster in a large city.

INFORMATION ON THE GREAT HANSHIN EARTHQUAKE

Before reporting our findings, we will refer to some basic information on the quake.

The 7.2 magnitude earthquake occurred in the early morning of Jan. 17, 1995, hitting Kobe City and surrounding areas where over 2 million people lived. As a result of the quake, over 6,000 people died, and about 37,000 people were injured. In addition, 570 children lost their parents. The quake itself destroyed 187,000 houses, and 7,300 more were destroyed by the fires that followed. The number of people who were made homeless by the quake was over 300,000 at the peak. In addition, there are roughly 75,000 people living in temporary housing still now (in Aug. 1996). Many of them are socially disadvantaged, for example the aged, the disabled and so on. The media have reported that more than 55 have died alone in temporary housing. According to the police, there have been over 30 suicides related to the quake (until Aug. 1996).

The city itself suffered severe damage. In some circumstances it took 3 or 4 months for tap water, electricity, and gas to be reconnected. Main railways became operational again 5 months after the quake. Factories were so badly damaged that even now (in Aug. 1996) some are not operational. Many people lost their jobs and some are still unemployed.

From this, it is evident that the victims suffered from several stressors: 1) traumatic experience caused by the quake itself; 2) the loss of family, house, and property; 3) stress from living in temporary housing or being homeless; 4) anger toward the government for insufficient relief services; 5) stress from changes of the socioeconomic environment; 6) stress from what appear to be unfair changes in circumstances of individuals in the community.

Dr. B. Rephael¹⁾ accumulated findings similar to ours concerning disasters.

EMERGENCY SERVICE AT THE HIGASHI-KOBE HOSPITAL

We will describe the situation of Higashinada Ward and emergency service at the Higashi-Kobe Hospital during the disaster.

Fig. 1 shows the map of Kobe City and its surrounding areas. Higashinada Ward is located in the east of Kobe. The Higashi-Kobe Hospital is marked as a star.

The numbers indicate the number of deaths in each ward of Kobe City or each nearby city. The highest number of deaths occurred in Higashinada Ward.

As is indicated in Table 1, before the quake about 190,000 people lived in this ward; that was about 10% of the total population of the disaster area. However the number of deaths was 1338, which was 24.3% of the total deaths. The mortality rate in Higashinada was 6.7/1000 population, the highest of the whole disaster area²⁾.

Table 1. The Higashinada Ward

POPULATION : 188,766 (Dec. 1. 1993)
 =about 10% of that in the entire disaster area
 THE NUMBER OF DEATHS : 1338 (May 8. 1995)
 =about 24.3% of the total deaths (5502)
 MORTALITY RATE : 6.7/1000 population
 the highest in KOBE and nearby cities
 HOUSING :
 a little over 50% =apartment buildings
 40% =built before 1981 (when new QUAKE-
 RESISTANT STANDARD was initiated)

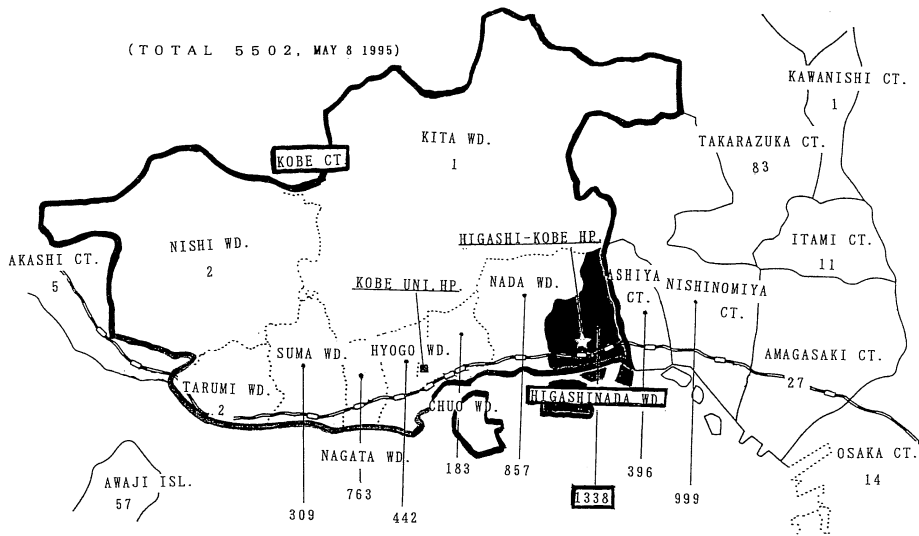


Fig. 1. The number of deaths in each area.
 CT : city ; WD : ward ; HP : hospital ; ISL : island.

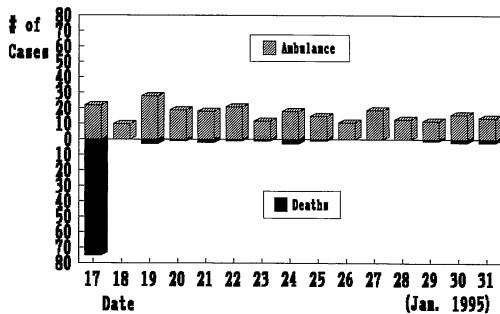
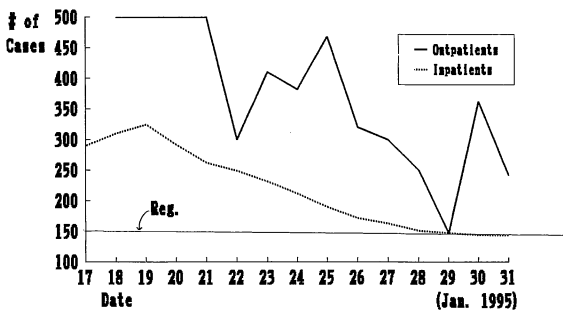


Fig. 2. Emergency medical service at the Higashi-Kobe Hospital (1).
 Reg : the number of hospital beds in regular use.

Fig. 3. Emergency medical service at the Higashi-Kobe Hospital (2).

In this ward, about half to the residents lived in apartment buildings which were located mostly in the coastal region. About 40 % of the buildings were built before 1981 when the new quake-resistant standard was initiated.

At the Higashi-Kobe Hospital medical staff started to provide emergency medical service immediately after the quake. Additionally a large number of medical volunteers came and helped at the hospital from all over Japan. The number of such volunteers amounted to about 6,400 in the first month after the quake. We carried out our work as a part of this volunteer effort.

Fig. 2 shows the emergency medical service at the hospital until the end of Jan. 1995. During the first 5 days over 500 patients presented at the hospital. On the first day the number was uncountably huge. The line "Reg" shows the regular number of hospital beds. However, the number of inpatients admitted peaked at more than twice this number. This surplus admission continued until Jan. 28, 1995.

Fig. 3 shows the number of patients delivered by ambulance and the number of deaths observed at the Higashi-Kobe Hospital. The number of ambulance cases was high in the first month after the quake. After that the number returned to normal.

On the other hand, there were 75 deaths on the first day. With the exception of one case, all of these cases were "Dead On Arrival," mostly due to crushing injuries.

In the days after, many disaster-related diseases were observed, such as injuries, crushed syndrome, pneumonia, heart failure, ischemic heart disease, cerebrovascular disease, ulcer bleeding and so on. And some of these were obviously due to the stressful conditions at shelters.

DISASTER PSYCHIATRIC SERVICE IN KOBE AND SURROUNDINGS

Actually there was no system prepared for disaster psychiatry before the quake, but many

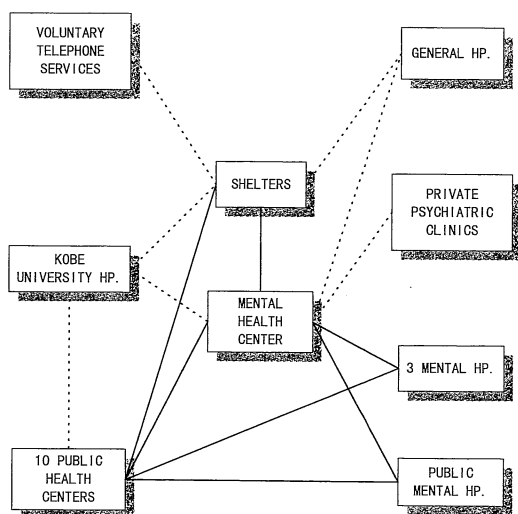


Table 2. Psychiatric patients at the Higashi-kobe Hospital consulted from Jan. 19. 1995 to Jan. 31 1996

OUTPATIENTS	204...*
LIAISON CASES WITHIN INPATIENTS	71
HOME VISITS	14
TOTAL	289

Fig. 4. Mental support services in the disaster area.—The administrative system.

psychiatrists volunteered their services immediately afterwards. They worked at Kobe University Hospital, the Mental Health Center of Hyogo Prefecture, private psychiatric clinics, mental hospitals in nearby cities, some general hospitals like ours, and so forth.

After that, some systematic disaster psychiatric services were gradually provided as instructed by the Ministry of Health and Welfare. This started on Jan. 21 and ended on April 30, 1995.

Fig. 4 shows that system. When a psychiatric case was found at a shelter, a medical team stationed there was to notify and transport the patient to the nearest public health center. Then the psychiatric case team at the public health center treated the patient, and if admission was necessary they sent the patient to a mental hospital. The Mental Health Center of Hyogo Prefecture offered and gathered valuable information on mental health service in the disaster area.

Out of this administrative system, many medical facilities willingly offered disaster psychiatric services. These facilities included private psychiatric clinics, the Kobe University Hospital and some general hospitals like ours. In addition, many university hospitals and mental hospitals from all over Japan sent psychiatric emergency care teams.

At the Higashi-Kobe Hospital our psychiatric team set up an emergency service on Jan. 19, 1995. Since then we consulted 289 patients in total before Jan. 31, 1996. There were 204 outpatients, 71 liaison cases in some hospital wards, and 14 home visits (Table 2).

This report is concerned only with the 204 outpatients.

FINDINGS

First, we will report some findings on the entire group of 204 outpatients. After that, we will report on the 145 "disaster-related cases" whose mental disorders were obviously due to the disaster.

(1) THE GROUP OF 204 OUTPATIENTS

Fig. 5 shows the change in the number of outpatients in the year after the quake. Our team

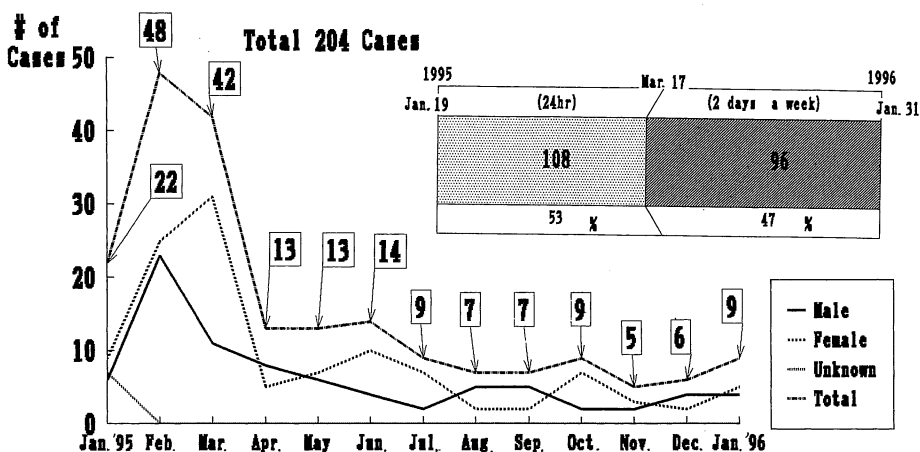


Fig. 5. Outpatients in the first year.

started work on the third day, Jan. 19, 1995. For the first 9 weeks, that is until Mar. 17, one or more psychiatrists were stationed at the hospital around the clock. Since Mar. 18, we have operated outpatient clinics 2 days a week. As a result, over half of the patients were consulted from Jan. to Mar. More exactly, before Mar. 17, we treated 108 outpatients, 53 % of the total. And during the latter period we treated 96 outpatients (47 %). In other words, new patients had been coming continuously to the hospital after Apr. 1995, and their numbers ranged from 5 to 14 per month.

Fig. 6 shows whether those mental disorders were related to the disaster or not: 145 cases, 71 % of all the outpatients we treated, were related to the disaster. On the other hand, 50 cases (25 %) were not.

“Related to the disaster” means patients who suffered from mental disorders for the first time due to the disaster, or patients who relapsed or exacerbated their prior mental disorders because of the quake. A large part of the 204 cases were related to the disaster.

With regard to this relation to the disaster, in terms of patients per month, some tendencies can be found (Fig. 7). The related cases ranged from 70 % to 80 % of total cases each month from Jan. to Mar., and then the ratio decreased. For example, the ratio was 60 % to 80 % from Apr. to Jul. and 30 % to 40 % from Aug. to Dec. However it increased to 67 % again in Jan. 1996. Perhaps this indicates the so-called “memorial day syndrome.” These disaster-related mental disorders have still been appearing for a year after the disaster, so it is anticipated that new cases will continue to be observed after this time.

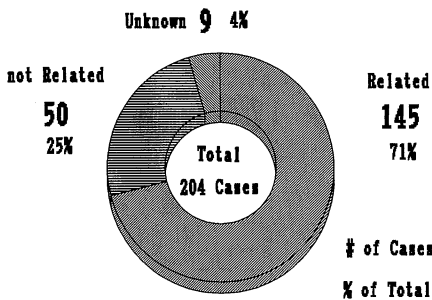


Fig. 6. Relation to the disaster (1).

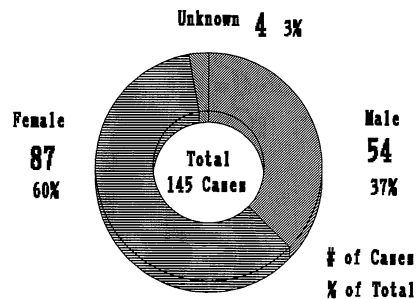


Fig. 8. Sex of 145 patients.

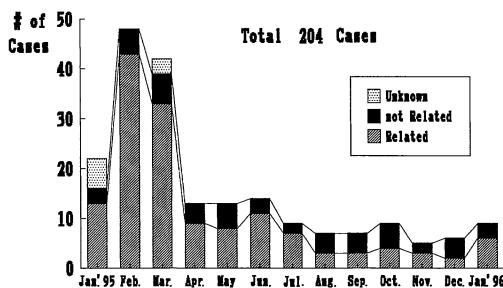


Fig. 7. Relation to the disaster (2).

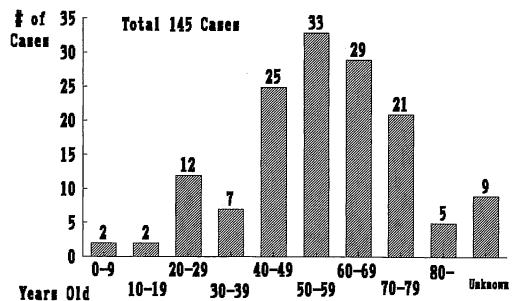


Fig. 9. Age of 145 patients.

(2) THE 145 DISASTER-RELATED CASES

Fig. 8 shows the sex of these 145 patients. Female patients visited more than male patients. (The former were 60 % and the latter 37 %. The sexes of the other 3 % cases were not determined.) The reason for this difference in sex cannot be concluded at this point, but this tendency is similar to findings of prior research in disaster psychiatry³⁾.

According to Fig. 9, 74.5 % of these 145 patients ranged in age from the 40's to the 70's. On the other hand, child and adolescent patients rarely visited our hospital. It is considered that they were treated by specialized facilities for children and also were taken care of by school teachers.

Fig. 10 shows the psychiatric past history of the disaster-related cases. Primary onset cases amounted to 82 (57 %), and relapse or exacerbation cases totalled 63 (43 %). So the number of primary onset cases was relatively larger than that of relapse or exacerbation cases. This trend was different from the admission cases into other psychiatric wards, for example the Kobe University Hospital⁴⁾ and the Kofu Hospital of Hyogo Prefecture⁵⁾. This difference seems to be due to the fact that almost all of the patients were referred to us by other doctors, like internists, surgeons and so forth.

Fig. 11 shows the monthly change of the number and the ratio of primary onset cases to relapse or exacerbation cases. Except for Jan. 1995 and April, primary onset cases consulted more than relapse or exacerbation cases each month. However the ratio of relapse or exacerbation cases was larger in the first 3 or 4 months than in the latter months. So it could be said that people with psychiatric past history would be the more vulnerable group of the population. In this sense, they would appear first as psychiatric cases in a disaster area.

Concerning psychopathological states, depressive state (37, 25.5 %), anxiety state (36, 24.8 %), PTSD (post-traumatic stress disorder) or PTSR (post-traumatic stress reaction) (21, 14.5 %), and acute psychotic state (13, 9 %) were frequently found (Fig. 12).

Fig. 13 shows the change of the number of patients with relatively severe disorders, such as manic state, acute psychotic state, alcoholic withdrawal syndrome and delirium. Most of them had to be admitted. Nearly all of these relatively severe cases visited our hospital during the first 3 months.

So from our work, it can be seen that even severe psychotic cases would be indiscriminately brought into a general hospital without psychiatric facilities, in the early period following a

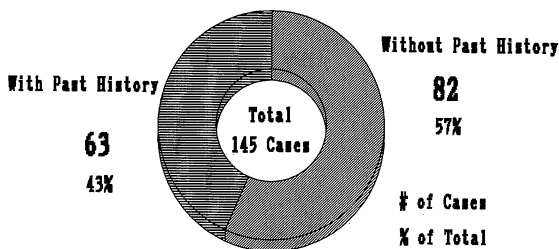


Fig. 10. Psychiatric past history of 145 patients.

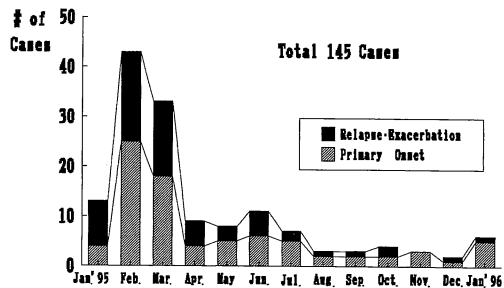


Fig. 11. The numbers of primary onset cases and relapse or exacerbation cases.

disaster.

On the other hand, relatively mild cases like PTSD or PTSR, somatoform, anxiety and depressive states have been found mostly since Feb. 1995. Also, these patients have visited our hospital continuously for over a year since the quake (Fig. 14).

Fig. 15 shows the proportion of primary onset cases and relapse or exacerbation cases on each psychopathological state. Concerning depressive state, anxiety, somatoform and PTSD or PTSR, many more cases were primary onset cases. However, regarding alcoholic and manic states all were relapse or exacerbation cases. It is said that this tendency to manic state was similarly observed in the admitted patients in other mental hospitals⁶⁾. In addition, with regard to delirium and acute psychotic state, primary onset cases and relapse or exacerbation cases were almost equal.

93 patients could be diagnosed definitely. These were 64.1 % of the 145 "disaster-related" cases. Fig. 16 illustrates that a large number of F 4 and F 3 groups of ICD-10 were consulted. In addition, 15 patients were diagnosed with PTSD (F 43.1).

(3) THE 108 CASES IN THE FIRST 9 WEEKS

Finally we would like to report some findings about all outpatients we treated in the first 9 weeks. They include both "disaster-related" and "not related" cases.

Fig. 17 shows the number of 2 psychopathological groups treated during this period. The upper part represents the relatively severe groups, such as acute psychotic state, manic state and alcoholic withdrawal syndrome. There were 15 patients with these conditions. The lower part represents the relatively mild groups, such as depression, anxiety and PTSD or PTSR.

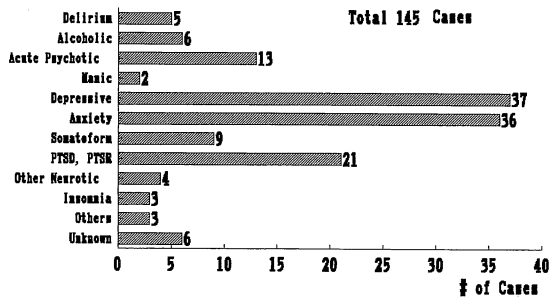


Fig. 12. Psychopathological states of 145 patients.

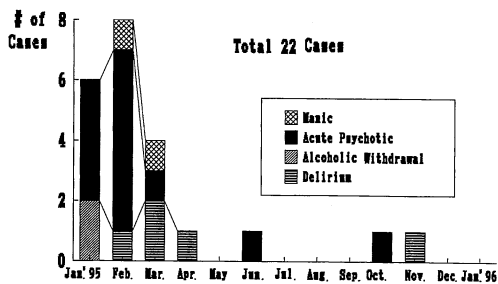


Fig. 13. Cases with severe psychopathological states.

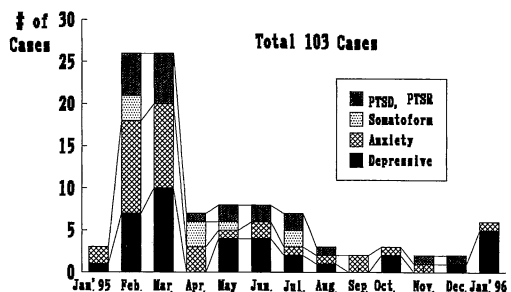


Fig. 14. Cases with mild psychopathological states.

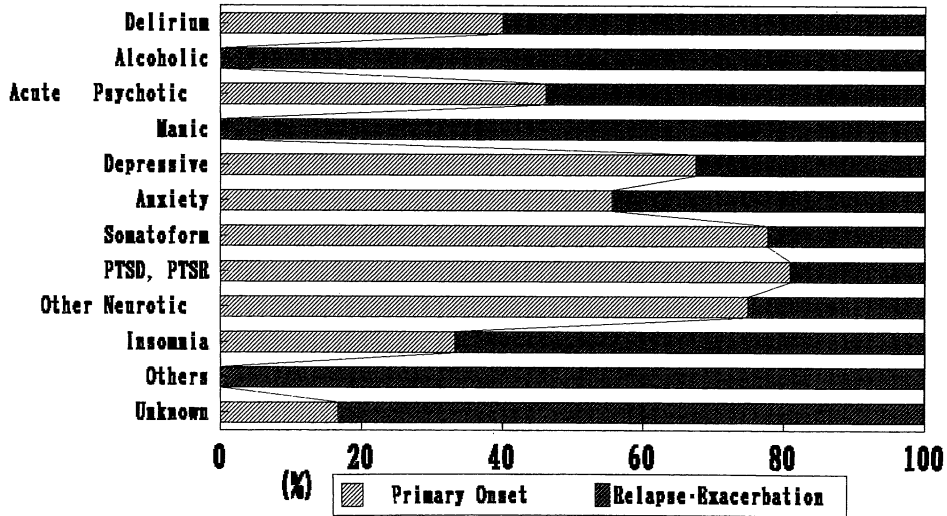


Fig. 15. The proportion of primary onset cases and relapse or exacerbation cases on each psychopathological state.

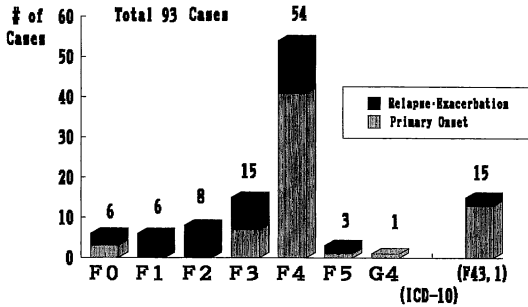


Fig. 16. Diagnoses of 93 cases.

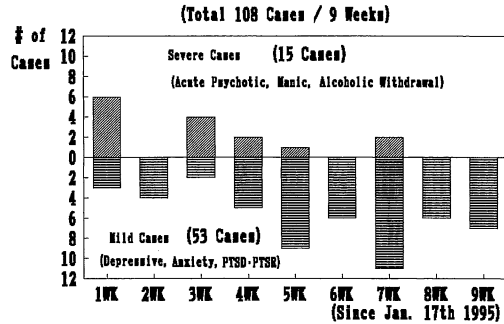


Fig. 17. The change of the numbers of severe cases and mild cases in the first 9 weeks.

There were 53 patients with them. The relatively severe cases were treated until the 7th week after the quake. And relatively mild cases increased from the 4th or 5th week.

Although we worked at a general hospital without psychiatric facilities, we needed to treat severe psychotic cases for the first 2 months immediately after the disaster. And about a month after the quake we were required to treat a lot of depressive states, anxiety and PTSD or PTSR cases.

CONCLUSIONS

(1) We have reported about our psychiatric interventions following the Great Hanshin Earthquake. Our work is special because we have been working at a general hospital located in the middle of the disaster area since immediately after the quake. This hospital did not have psychiatric facilities before the quake, so our work was different from other disaster psychiatric work performed during the same period following the disaster.

(2) We have treated 204 outpatients for a year after the quake. There were 145 "Disaster-related" cases, 71 % of the total outpatients. Concerning these 145 patients, there were more females than males. Most of them were between 40 and 80 years old. The number of patients with a history of psychiatric treatment was slightly less than of patients without it. Several psychopathological states were observed. In decreasing frequency, they were depressive state, anxiety, PTSD or PTSR and acute psychotic state.

(3) During the first 2 months after the quake, we treated relatively severe psychotic cases even at the general hospital. From a month after the quake, a large number of relatively mild cases visited our hospital. So we had to prepare to deal with these 2 different patient groups.

(4) From our experience, when a large city is hit by a catastrophic disaster, it is effective to set up psychiatric emergency services at some general hospitals, simultaneously with other kinds of psychiatric emergency services. This is efficient because a big city usually already has many medical facilities before a disaster. Finally, as the WHO⁷⁾ and Dr. U. F. Malt and L. Weiseth⁸⁾ have mentioned, we certainly agree that it is effective and necessary to work together with other doctors.

This report was partially presented at the 10 th World Congress of Psychiatry in Madrid, Aug. 1996.

Acknowledgment : We are very much grateful to the nurses, doctors and other staff of the Higashi-Kobe Hospital for their contribution to this paper. We also wish to express our great respect for their important and brave work against such an amazing difficulty in the midst of the disaster.

In addition, we appreciate the work of our volunteer psychiatrist colleagues who came from all over Japan and performed disaster psychiatric services together with us.

REFERENCES

- 1) **Raphael, B.** : When disaster strikes. Basic Books. Inc., New York, 1989.
- 2) **Mouri, I.** : Who were killed by the Great Hanshin Earthquake?, in "A report on influences on the health of Great Hanshin Earthquake survivors". (Zen-nihon min-iren ed.) Hyogo min-iren, Kobe, p77-83, 1996 (in Japanese).
- 3) **Shore, J. H., Tatum, E. L. and Vollmer, W. M.** : Psychiatric reactions to disaster: The Mount St. Helen's experience. *Am. J. Psychiatry* **143** : 590, 1986.
- 4) **Hosaka, T., Shirakawa, O. and Nakai, H.** : Cases in psychiatric ward after Hanshin-Awaji Earthquake. *Japanese Journal of Psychiatric Therapy* **11** : 249-256, 1996 (in Japanese).
- 5) **Iwao, S., Kouchi, Y. and Yamaguchi, N.** : Study on admitted case during 3 months after Hanshin-Awaji Earthquake. *Japanese Journal of Psychiatric Therapy* **11** : 341-348, 1996 (in Japanese).
- 6) **Yamaguchi, N.** : The record of hospital activity following the Great Hanshin Earthquake written by the director of Kofu Mental Hospital of Hyogo Prefecture. In "January 1995 in Kobe". (Nakai, H. ed.) Misuzu Inc., Tokyo, 1995 (in Japanese).
- 7) **WHO** : Psychosocial consequences of disasters-prevention and management. Geneva, 1992.
- 8) **Malt, U. F. and Weiseth L.** : Disaster psychiatry and traumatic stress studies in Norway. *Acta psychiatrica scand. suppl.* **355** : 7-12, 1989.