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原 著

Development of a 5W1H Program for the Cure Management of Pathological Factors in Strabismic Patients

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Abstract

For accurate and adequate maintenance and management of outcomes of clinical cases, all medical staffs are required to have practical and professional knowledge in medical science as well as ability to put it into action. To understand all cure states of strabismus, we have contrived and examined computer assisted management methods based on the problem oriented medical record (POMR) system. In this study, we used "the CARD 3" as a software, comprising a start up disk and a program disk, along with the computer NEC PC9800 PC-98RL. Individual patients were registered according to the 5W1H item classification (when, who, where, what, why, and how), and then analyzed. To express symptom severity, pathological factors were marked with simple numbers. Medical staff in charge of treatment recorded problems of each patient on a card at the time of discharge, and the problems of this patient were analyzed by computer according to the registered data. Since changes occurring after registration were also registered additionally, we could continuously cope with up-to-date problems of individual patients using this cure management method.

Introduction

The primary purpose of patient's visit is to cure his or her disease. However, this purpose is not sometimes fulfilled easily. In order to solve this problem promptly, the medical staff should always understand what extent the patient is cured. However, by means of

the Japanese health insurance system cannot give grounds for the scientific analysis performed to determine what pathological factor is cured and what is not, because we cannot classify outcomes at the time of discharge into complete recovery, remission, no change, worsening, death, transfer to another hospital, accident, and completion under this system.

With this in mind, we have developed and reported methods of expressing severities of disorders with simple numbers given to the corresponding pathological factors based on the problem oriented medical record (POMR) system since 1981[1-4]. Although we first prepared two kinds of programs, PL (problem list) and 5W1H (when, who, where, what, why, and how) programs, using the NEC PC-8001 computer, we could not apply our methods to record of patient's specific problems or statistics of some figures examined because the computer used at that time was restricted in the number of input letters and letter styles. We then examined the other system for case registration according to the 5W1H item classification (when, who, where, what, why, and how) using a more improved computer, NEC 9800 PC-98RL. This report focused on the statistics of strabismus and ocular disease under our new system.

It is known that there were a great number of neuro-pathological problems related to pathological conditions of strabismus. Statistical factors had, in fact, increased infinitely in number as a result of rapid progression of neuroscience. The POMR system, which was made the basis of 5W1H programs, was a medical record method proposed by Weed[5]. Under this system, problems of the disease were listed up, and outcomes of individual patients were recorded. This system was suitable for statistical analysis of active and resolved problems on each patient. The 5W1H program itself can also cope with all matters. Thus our 5W1H program can be applied not only to patient's registration, but to education and researches as well.

Methods

A hardware used was a NEC 9800 series PC-98RL, including a keyboard, an integrating circuit, a display, and a printer. The computer was driven by the CARD 3, which comprised a start up disk and a program disk. The first disk for starting made the computer ready to read orders from the program and for manipulation. The second disk, a program disk, gave orders of manipulation steps, such as input, search, printout, etc., to the computer. The CARD 3, which was a data base of card type, set up parameters needed for input and designed the card itself. Since easy recording and rapid search are characteristic of a card-type data base, the CARD 3 was a great convenience for simple manipulations of accumulation, arrangement, search, process, and printout of data, enjoying advantages of the card system. The data on each patient were registered to a disk for registration for data storage.

Results

An actual case of secondary exotropia

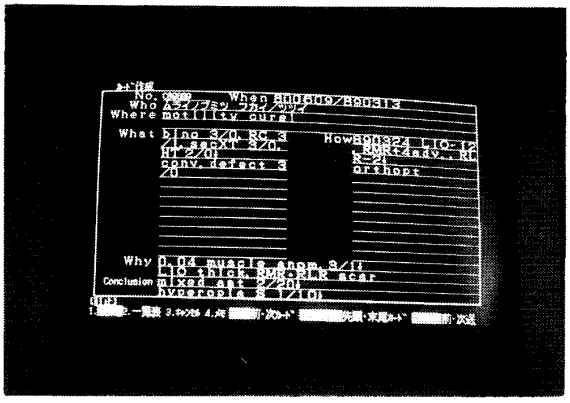

Fig. 1 An actual registration case by 5W1H program

registered is illustrated in Fig. 1.

"No. (10 letters)" records the medical record No.

"When (20 letters)" records the hospitalized or birth date.

"Who (32 letters)" records patient's full name, age, sex (male or female), and the name of attending ophthalmologist, and the name of orthoptist in charge.

"Where (64 letters)" records a classified state of the disease, "motility" for this patient, and a cure rank, "cure 1" for this patient. Fig. 1 shows main locations of classification of this patient, performed according to the given criteria.

"What (224 letters)" records the name of disease, major symptoms, and results of abnormality evaluation.

"sec. XT" shown in the figure indicates that this patient originally had esotropia, but developed secondary exotropia (sec. XT) during the treatment course.

"3 (pre-treatment)" and "0 (post-treatment)" indicate the improvement of the patient from severe abnormality (3) to normal state (0). In this figure, satisfactory cures from "bino. (binocularity)" and "HT (hypertropia)" are also noted. "RC (retinal correspondence)" indicates the presence of normal retinal correspondence.

"Why (32 letters)" records matters related to causes of disease. "muscle anom." indicates the presence of abnormality in the extraocular muscle.

"How (224 letters)" records treatment methods, date of operation, details of operation, etc. For example, "LIO-12" indicates that the inferior oblique muscle is reduced in tension through 12 mm recession ; "RMR+4adv." indicates the performance of 4 mm advancement of the right medial rectus muscle ; RLR-2 indicates the performance of 2 mm recession of the right lateral rectus muscle. In addition, "orthopt." indicates the performance of orthoptics following operation. In the column of conclusion, problems, which could not be classified into any of the above-mentioned main items, are recorded. Descriptions shown in the figure indicate the presence of mixed astigma, hyperopia, alternate hyperphoria, torticollis, EEG anomaly, and birth anomaly.

Severity of Symptom and Criteria of Cure Evaluation

The most valuable aspect of the 5W1H program was that therapeutic efficacy can be double-checked from the two points of view ie, severity of symptom and cure evaluation.

The severity of every symptom was used the method of severity expression established by Japanese Association for ocular Infection. A severe abnormality is expressed as "3" while "0" indicates a normal state. Moderate and mild abnormalities are respectively expressed as "2" and "1." The numerator indicates the pre-treatment severity, and the denominator indicates the post-treatment severity. Namely, every symptom was marked with a fractional expression.

Descriptions of cure evaluation were decided as follows : Cure 1 indicates complete recovery ; Cure 2 indicates disappearance of all major symptoms without practical problems ; Cure 3 indicates remission of major symptoms, while minor symptoms remain ; Cure 4 indicates no healing at all, or worsening ; Cure 5 indicates impossibility of evaluation due to the lack of sufficient data or unclear data.

Actual Cases of Cure Evaluation of Strabismus

It is possible to search various problems of the registered individual patients, and every problem can be printed out at each cure level.

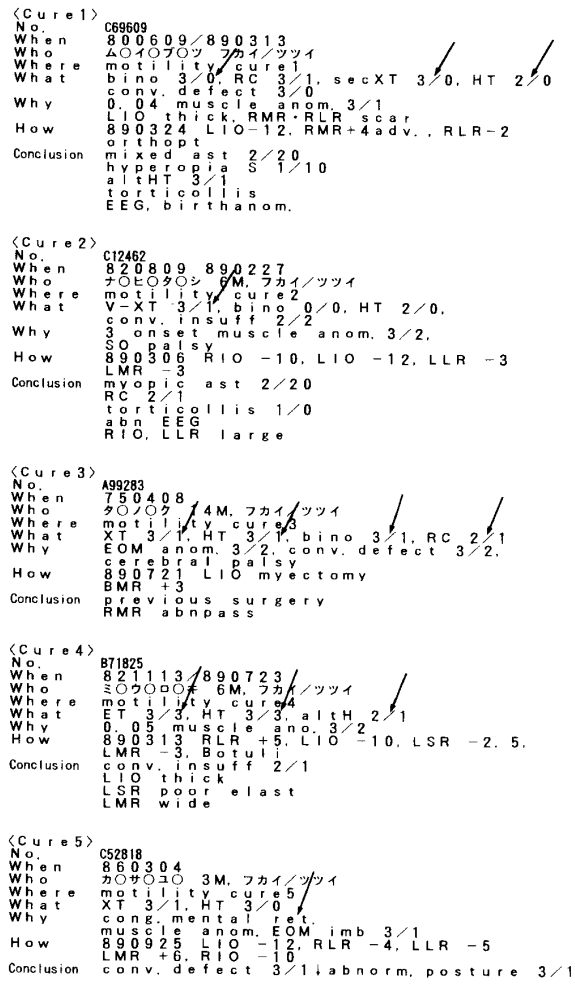

Fig. 2 Represent from cure 1 to cure 5

These are all very advantageous to cure management.

As Fig. 2 shows, the author searched 1 patient each ranked from Cure 1 to Cure 5, and printed out their data. Arrows indicate grounds for evaluation. The Cure 1 case is the patient with complete recovery described in Fig. 1. Major symptoms, including esotropia (ET), secondary exotropia (sec. XT), and abnormal binocular function (bino.), completely disappeared. In the Cure 2 case, V-type exotropia was remitted from an abnormal degree of 3 to 1. In the Cure 3 case, although exotropic factors decreased in number, exotropia still remained for a part, and abnormalities in binocular function and retinal correspondence reduced only to a small extent. In the Cure 4 case, esohypertropia expressed as ET3/3 and HT3/3, remaining at the same abnormal level. The Cure 5 case could not be examined in details due to mental retardation.

So far representative cases have been described. When we use our new system, it is possible to compare cure states among a large number of patients, and our patients who has not yet healed can be used as subjects to further studies.

Way to Wider Use

The 5W1H system can be used not only for registration and analysis of clinical cases, but also for registration of the medical literature, research data and educational curriculum. For literature registration, "When" records the year of publication, "Who" records authors' names, "Where" records authors' addresses or the name of a publisher, "What" records the title and brief contents. A total of 686 letters can be registered per card. Today it is possible to input and print out the data in English as well as in Chinese letters and the Japanese cursive syllabary. Thus this system is greatly useful because it can be used in a wide range of scientific fields without use of specific software.

Conclusion

We described a method of understanding states of cure management of clinical cases using the 5W1H system.

This system requires the medical staff to have practical and professional knowledge in medical science as well as ability to put it into action for adequate data maintenance over a long period of time.

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斜視病態因子の治癒状況把握のための 5W1H プログラムの展開

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要 約

臨床症例の転帰を正確に維持し管理することは，医療に従事する人達の高いレベルと実行力が要求される．私共は，斜視の治癒状況の把握のために POMR 方式を基本としたコンピュータ管理方法を考案し試行した．本法はソフトとして「The CARD 3」ディスクを使用した．「The CARD 3」は起動用ディスクとプログラムディスクとからなっている．使用器械は NEC PC9800 PC-98RL をもちい，5W1H (When, Who, Where, What, Why, How) の項目分類に従って症例を登録し，分析するシステムを試行した．症状の軽・重障害度は疾患形成因子に簡単な数字を付して障害の程度を表現する方式をとった．本法は治療を担当した医療職者が症例を一例ずつ退院時にカードに記入し，それに基づいてコンピュータ処理を行う．これ以後の変化については，追加し登録することは可能であり，永続性のある管理方法である．