

AN ORIGINAL PC PROGRAM FOR REGISTRATION, STORAGE AND ANALYSIS OF DATABASE ABOUT PATIENTS WITH BRAIN TUMORS

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ABSTRACT

An original PC program developed and designed for registration, storage and analysis of database about patients with primary and secondary brain tumors was presented. The so called "Program for operation of hospital charts of patients with brain neoplasms" was based on information from routine and modern clinical, instrumental and immunological methods for diagnosis, monitoring and prognosis. It was designed as a PC model of a chart for registration with unique mode of operation of patients' entry characteristics, forming of their results into database and opportunity for calculation and prognosis of exit parameters such as probable survival rate and etc.

The main task of the program was to provide a useful data for the investigated patients with brain tumors. It was achieved by application of a real chart for collection and extraction of filtrated information about clinical cases with similar characteristics. The entire operation of the database was set up by Microsoft OLEDBDC driver 2003. The integral functionality concerning screen imaging, entry, correction, erasure, search and calculation of data was realized with program language Microsoft Visual C# 2003. The presented program was highly informative and easily available for routine administration in the neuro-oncological practice.

Key words: brain tumor, information system, PC program, database, hospital chart

INTRODUCTION

The intracranial neoplasms are a mixed group of primary and secondary tumors characterized with increasing incidence rate, high mortality and poor survival, especially the malignant ones (7, 12). Although uncommon they belong to the group of significant social diseases that seriously worsen patients' quality of life and cause enormous economical expenses concerning their treatment and medical care. Despite the application of modern diagnostic methods, therapeutic agents and minimally invasive neurosurgery techniques brain tumors still present with disproportional to their morbidity high level of discrepancy and mortality (5, 7, 9, 11). Based on these facts the management of pa-

tients with primary and secondary brain tumors acquires an essential medical, social and economical importance. Therefore, all the efforts expended to improve the organization of neuro-oncological health care are justified.

Previous and current reports support the interest towards administration in clinical practice of information programs for electronic medical record of data concerning diagnosis, follow-up and prognosis of patients with intracranial neoplasms (1, 2, 3, 5, 8, 11). So, our purpose was to develop an original model of PC program for registration, storage and analysis of database about patients with primary and secondary brain tumors.

MATERIAL AND METHODS

A total number of 194 patients (93 females and 101 males, mean age 46.8 ± 14.8 years) with different primary brain tumors (gliomas, meningiomas, pituitary adenomas etc.) and metastases were studied. The summarized clinical, neuroimaging (radiological, electrophysiological etc.) and immunological results and multivariate assessment of their diagnostic and prognostic value enabled the development of a PC program for registration, storage and analysis of database about patients with brain tumors.

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The main task of the program to provide a useful data for the investigated patients was realized by application of a real chart for collection and extraction of filtrated information about clinical cases with similar characteristics. The entire operation of the database was set up by Microsoft OLEDBDC driver 2003. The integral functionality concerning screen imaging, entry, correction, erasure, search and calculation of data was accomplished with program language Microsoft Visual C# 2003. The system requirements for program processing were Windows 98/XP/2000 (or later versions), minimal 32MB RAM and 3MB free disc space.

RESULTS

The realization of PC unified model of a hospital chart (display picture № 1).

To acquire unification of collected data after their analysis they are divided into two groups: data with free answer and data with preliminary prepared (fixed) answer. The data with free answer are those the user is able to give a free definition while with fixed answer are when the user can choose one or more among several possible fixed variants. The correct imaging of the hospital chart model needs the collection of data under the form of questions requiring the user to write down the corresponding answer. Limitations over the choice of fixed answers are added on for the purpose of correct patients' data collection. Graphic image shows whether the user may choose one or several answers.

Setting of PC unified model of a hospital chart (display picture № 2).

The correct graphic imaging of the chart on the PC screen requires the following question's characteristics to be known: number, situation on the screen page, is it obligatory or no and etc. It is realized by module "Settings", called from PC menu "Settings". The main task of this module is the user to be able to develop a maximally close model of hospital chart as well as to have a unique possibility for futures easily change or adaptation. The information about questions and answers is introduced in tables corresponding to screen pages, questions, answers and sub-answers. Each question or sub-answer includes the following parameters: name of the page /question/answer/sub-answer; number of questions on the page (no limitation for numbers); number of imaging sequence of question/answer/sub-answer on the page; numerical factor of answer/sub-answer; whether the question requires fixed or free answer and whether the question/answer has sub-answers (limitation to 5 levels of sub-answers).

Collection of information about a patient with brain tumor.

The program allows the introduction of entire patient's personal data and disease information on screens similar to the paper presentation of the chart. The entered data are accepted by pushing the corresponding button. The program checks whether all the obligatory questions acquired their answers before the storage of information in the database. This functionality prevents the user from missing the introduction of important information for calculation of exit parameters such as statistically most probable survival rate. The type of current hospital chart is indicated simultaneously with the registration of information in the database.

It allows a unique collection of data from different types of hospital charts without destroying the integrity of other patients' data. In this way the unified PC model of data storage is actually achieved.

Filtration of useful information (Display picture № 3).

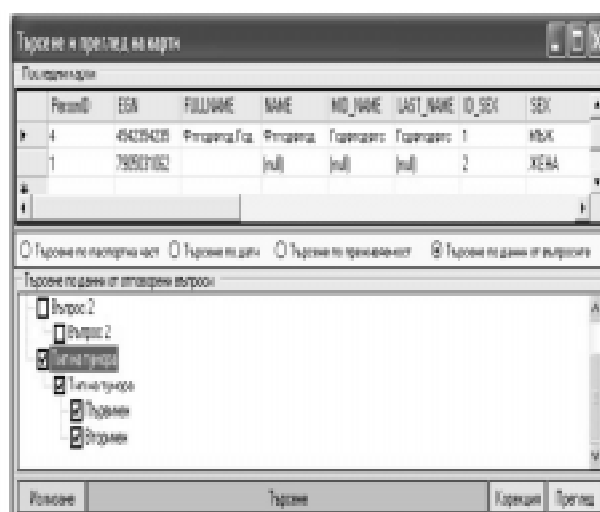
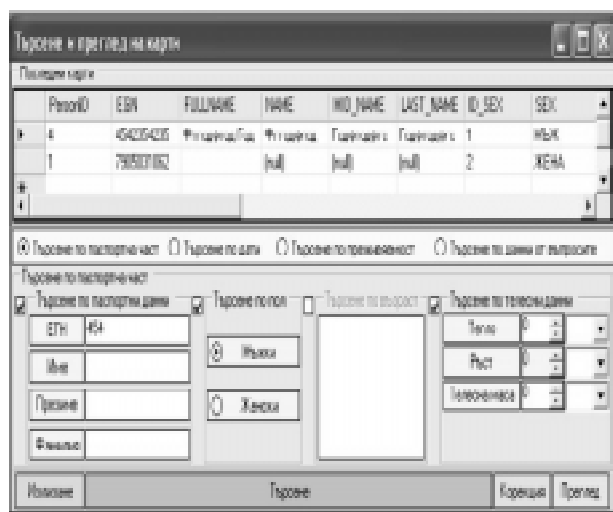
The program offers a module for filtrated search of patient's information based on different factors. Searching according to the preliminary initiated patients data is realized by specially created a tree-like control for search. The extraction of information is made by means of data bar supplied additionally with controls for filtration on columns. The manipulation of extracted information is done by functional supplements like review, correction and printing on a paper carrier of selected hospital chart from data bar.

DISCUSSION

The current epidemiological data confirm the increasing morbidity, high mortality and low survival rate of patients with primary and secondary intracranial neoplasms, especially the malignant once (5, 7, 12). Although the development of new diagnostic strategies, anticancer drugs and neurosurgery techniques the brain tumors still present a great challenge for the neuro-oncologists (7, 9, 11, 12). Therefore the review of literature shows a rising interest addressed to the establishment of recent technologies in the management of different diseases, including intracranial malignancies (1, 3, 6, 10, 11). It is obvious that the contemporary neuro-oncological health care needs modern information systems and programs enabling the accurate registration, analysis and rapid exchange of medical data. Regardless the differences in operating systems, computer languages, software, statistical packages, databases and etc., current evidences prove the development of automatic programs and algorithms applied in the experimental and clinical practice (1, 2, 3, 6, 10, 11). They all aim collection, storage and extraction of medical information extremely required for successful planning, organization and rule of high quality health care (4, 8, 9, 11).

CONCLUSION

The presented own model of PC program goals the registration, storage and analysis of database about patients with primary and secondary brain tumors. It is high informative and available for routine application in the hospital and out-patient neuro-oncological practice. Therefore, it can be used by all kinds of specialists and social workers involved in the diagnosis, treatment and monitoring of patients with intracranial neoplasms.



Display picture № 3.

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