THE COMPUTERIZATION OF MATERNITY INFORMATION

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The way for medical statistics was opened by John Graunt of London in 1662 with his work "National and political observations upon the bills of mortality" wherein he showed among other things that the maternal mortality was one in two hundred and that one-third of infants perished before the age of three years. It was however only in 1837 that the Registrar General's Office for England and Wales started to keep accurate records of all births, stillbirths and maternal deaths. In that same year, the Presidents of the Royal Colleges of Physicians and Surgeons asked the medical profession to submit certificates of deaths stating if possible the cause. Demographic information on the Maltese Islands can be traced to the year 991 when the first census in Malta was carried out. Civil registration was introduced in Malta only in 1863 and the Regular publication of vital event registration data in Malta can be traced back to 1872, though earlier statistics can be found in the parrochial registers.

The collection of medical information is an essential pre-requisite for any country in order to assess its level of health care, identify problems and focus on priorities for improvements. Vital event registration is usually derived from civil registration, which is often compulsory. In the Maltese Islands, this information is collected by the Central Office of Statistics which publishes an annual demographic review (1). This includes information about population changes resulting from deaths, births and migration; perinatal and infant mortality statistics; data regarding death and infectious disease; and data regarding marriage.

With advances in medical science and public expectations, and with new trends in administration, there is increasing pressure from clinicians and administrators for more and for better medical information. The Maltese Islands are presently especially suited for epidemiological studies on obstetric patients since about 97% of all deliveries occur in the State Hospitals: 90% Karin Grech Hospital; 7% Gozo General Hospital (2).

The volume of data which requires to be processed on an annual basis can only be suitably managed by the use of computers. Before 1983, the clinical annual reports compiled by the Department of Obstetrics and Gynaecology in Malta were laboriously assembled by hand from the Labour Ward Birth Registers and the case records of patients with a bad obstetric outcome. While these reports are interesting to the clinicians and the hospital administrators, they are of limited utility epidemiologically since they gave information only about abnormalities and did not provide a standard for comparison.

In 1983 in conjunction with the Government Computer Center (Malta), collection snd analysis of clinical data of all maternities occurring at Karin Grech Hospital was inyroduced with a statistically event-oriented programme. This programme continued until the end of 1986 and included 89.8% of the total maternities occurring in the Maltese Islands during this four-year period. Data capture was efficient with over 99% of patients delivering at Karin Grech Hospital being registered. The programme facilitated the preparation of a detailed annual clinical report and the evolution of a number of epidemiological studies (2).

During 1986, the Department of Health in conjuction with the World Health Organisation introduced a computer-based INDIVIDUAL HEALTH PROFILE aimed as a person-based record for all patients who encounter government medical services with the aim of providing readily available clinical information to medical practitioners on the patients they are treating, of scheduling appointments and follow-up procedures, of managing immunization and the preventive programmes, and of conducting surveys and research (3). The INDIVIDUAL HEAITH PROFILE included socio-medical information about each patient and the medical diagnosis at each encounter.

The Department of Obstetrics and Gynaecology was offered these new facilities for introducing a computer-based Medical Record for its obstetric patients. This involved the modification of the previous statistical event-oriented programme in use during 1983-1986 to a patient-oriented one, thus necessitating a number of encounter forms to be devised for data collection. The INITIAL ENCOUNTER FORM, expanding on the INDIVIDUAL HEALTH PROFILE, contains basic information about socio-biological characteristics and data on previous medical, surgical and obstetric history, drug and family history. The second form is the ANTENATAL EXAMINATION FORM which includes information about the menstrual history and medical data including information about hospitalization and any antenatal disorders. This form also includes information about the general and obstetric examination of the patient, besides recording the results of any investigations performed. After delivery, while the patient is in the Postnatal Ward, a third data sheet is completed. The INTRAPARTUM DATA FORM contains information pertaining to labour, delivery and the early puerperium until discharge from the hospital. In addition, it also includes basic information about infant characteristics besides information about the placenta and cord.

Computer Shared Ambulatory Record

The system used is the CMG-COSTAR, which is designed for use as an extension of the traditionally manually operated medical records. It was initially planned that the relevant encounter forms will be completed by the attending physician who was also responsable for the manual Medical Record. However, after a feasability study, this was found to be impractical in view of the large numbers of patients attending the antenatal clinics at Karin Grech Hospital. In 1987, 4834 pregnant women booked with the hospital. The antenatal care of these patients was shared between the hospital (15217 follow-up visits), the Primary Health Centers (5047 visits), and the private practitioners. The total number of admissions to the Antenatal Ward amounted to 2578, while there were a total of 4899 hospital deliveries (2). A system was thus organized whereby data transfer from the manual medical record onto the encounter forms was done by a team of two part-time midwives and a health assistant clerk. The completed forms are then sent to the Health Services Information Unit where the data is transferred to the computer by trained personnel. The system of using a team of data collectors was found to be more reliable and efficient than when data was collected by medical personnel. The team became very used to the notes and could find their way through these quickly. They were made to feel a part of the medical team and had free access to the doctors for any quiries. The overall data capture rate of the system during 1987 approximated 91 %.

The transfer of information from the manual medical record to the data collection forms and eventually onto computer allows for the possibility of transcription errors, especially where text is involved. The case record data sheets have been structured with this possibility in mind and information items are clearly defined whenever possible. Another problem associated with the system is

breakdown in confidentiality. Security and confidentiality of patient information are inherently ensured by the CMG-COSTAR System if a dedicated computer is used. The only possible breakdown in (11) confidentiality can occur in the period between data collection and its processing onto computer. However by encouraging the use of the national Identity Card Number, the risk is not greater than access to the Manual Record.

The scope of this person-based programme, besides facilitating statistical analysis, is to make easily available the individual patient records to the practitioner. The data can be arranged by (12) the computer in a flow-chart format mimmicking the manual medical data record with which the practitioner is familiar. Four obstetric flow charts are presently designed. The first chart identifies obstetrically important socio-biological characteristics, the past medical history and the general examination of the patient. The (13) second chart outlines the past obstetric history of the patient. (14) The third chart outlines the antenatal obstetric observations in chronological order, while the final chart tabulates in (15) chronological order the antenatal investigations.

DISCUSSION

The collection and evaluation of obstetric data is essential for measuring the adequacy and effectiveness of the health and social services in a country, rendering possible the reallocation of (16) resources and long-term planning on the basis of changing health needs. Organisation of a standard maternity and neonatal record on a regional or national level is difficult though ideal, but this is possible in a situation where the majority of deliveries are conducted under the supervision of one department. In the United Kingdom efforts are under way to attempt to standardize data collection on a national level (4), thus enabling better evaluation of perinatal statistics.

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Within the framework of the World Health Organization European Regional Strategy for Health for All (5), it is proposed that "before 1990, all member states in the European region should have formulated research strategies to stimulate investigations which improve the application and expansion of knowledge needed to support their health for all developments". A system of computerization of data is essential to acchieve the WHO target.

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While much of the information necessary for data analysis can be obtained from event-based programmes, which are simpler to organize and manage, a person-based programme facilitates linkage of pregnancy events to previous or subsequent events occurring to the patient. It also provides an update on medical data to doctors about the individual patient interdepartimentally. The data sheets in use in the Department of Obstetrics and Gynaecology should be used as a model, modified and expanded for use in other departments in the Government Medical Services.

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