THE DEVELOPMENT OF A COMPREHENSIVE CLINICAL INFORMATION SYSTEM FOR OBSTETRICS

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SUMMARY

The microcomputer system currently being used at St Mary's Hospital to collect data for perinatal audit and to produce pregnancy documentation is the result of many years experience in data collection by computer. The development of the system is described and the reasoning behind each decision affecting its design is explained.

1. INTRODUCTION

Over the past years we have been developing computerised patient information systems primarily for clinical audit. Initially we used a questionnaire and mainframe computer and some of the disadvantages of this system in contrast to an on line microcomputer system have previously been described (1, 2, 3). With the event of the microcomputer we purchased a Commodore PET in 1979 with the object of producing the statutory birth notification form and a very simple perinatal audit. Initial experiences with this system have been described (3) and it has been subsequently extended. We have now in 1984 moved over to a network of ICL microcomputers to achieve the following objectives: to obtain as much as possible of the essential pregnancy documentation to avoid duplication of effort; to achieve compatibility with the recommendations of the Korner Committee (4) and of the Royal College of Obstetricians and Gynaecologists; to be compatible with the Regional mainframe computer, but to be a simple system capable of being used by individuals inexperienced with the use of computers.

This paper describes the development of our current system from our past experience with mainframe and microcomputers in a busy clinical department of obstetrics and gynaecology.

2. DATA BASE DERIVATION

The way we previously derived our data base has been described in detail (2, 3). In brief our mainframe computer file of 2386 pregnancies collected between 1976-78 had
426 numerical data items. These were analysed for ease of collection and reliability. Each item was then assessed as to the reason for inclusion and if it was not required for birth notification, discharge summary or for simple perinatal audit, it was excluded. This reduced the data base to only 106 items, which were divided between two data inputs. Subsequently during usage in 1982-83 8 items were added for various reasons for example at the request of community midwives and family practitioners.

In Britain there have been recent attempts to standardize maternity information systems. The Korner Committee has reported on all aspects of data collection in medicine with specific recommendations for maternity cases (4). These are now being piloted and our data base was thus extended to include the additional items. Not all of these items had been previously assessed for reliability or ease of collection (e.g. presentation of fetus before manipulation in labour, reason for change of intended place of confinement) but this will be evaluated in the pilot studies.

Data for one district hospital may show some interesting facts but more important is the information obtained for a whole region. Whereas our hospital delivers 2500 per annum our region has over 40,000 deliveries. Accordingly we have a Regional Perinatal Working Party aiming to standardize data collection between hospitals. A sub-committee of obstetricians, neonatologists and epidemiologists reviewed the new data base and made further minor alterations including the recommendation that some of our items should be optional. Thus after all these procedures the current data base of 171 items was reached.

3. HARDWARE

The initial development was on two Commodore PET microcomputers each consisting of a VDU with keyboard and 32 k of memory, a dual floppy disc drive unit and a matrix printer. Routine use of this configuration over a period of nearly two years showed the limitations of using independent microcomputers for this type of application and with the expansion of the system to include the Korner recommendations, it was decided that a more powerful microcomputer with multiuser capabilities was required. Due to the nature of the application which requires a large amount of processor time relative to disc access for data validation and screen handling, a system of networked microcomputers was chosen in preference to a time sharing system in which individual terminals compete for central processor time. In a network each terminal acts as if it were independent from the others with response time only affected by other users during disc accessing.

For the new system a number of hardware requirements were identified. On the princi-