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Increase in information content in histopathology reports: a concealed workload for histopathologists

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Abstract

Introduction: The workload of histopathologists is traditionally assessed by the total number of specimens handled annually (TSA). Development in medical science has resulted in an increased demand by clinicians for more information in histopathology reports. Inclusion of this information requires more work. Annual information output (AIO) is the total number of specimens handled annually multiplied by the average number of items of information per histopathology report (AIR). An item of information is any pathological feature of prognostic or therapeutic relevance. ***Objective:*** This study aims to determine whether there has been an increase in annual information output (AIO) during a 17-year period. ***Method:*** This is a retrospective study in a University Department of Pathology. 200 histopathology reports per year at 4 yearly intervals from 1982 to 1998 were examined. TSA, AIR and AIO were calculated. ***Results:*** TSA increased from 2912 in 1982 to 3919 in 1998 (34.6% increase). AIR increased from 1.11 to 3.12 (181.1% increase). AIO increased from 3232.3 to 12227.3 (278.3% increase). ***Conclusion:*** The increase in AIO was greater than the increase in TSA. Thus the use of TSA alone will not reflect the increase in workload accurately. We recommend the use of AIO rather than TSA to quantify workload and staffing requirements of histopathologists.

Key words: information content, workload, histopathologist

INTRODUCTION

The workload of histopathologists has traditionally been assessed by the total number of specimens reported.[1] This method may have sufficed at a time when histopathology reports merely provided the diagnosis. A recent increase in knowledge regarding the prognostic and therapeutic relevance of certain pathological features has resulted in an increased demand by clinicians for more information in histopathology reports.[2] Inclusion of this information requires meticulous handling of specimens and intensive scrutiny of microscopical features. Despite the recent emphasis in the West[1,2] this aspect of workload has hitherto not been addressed in Asia, where the histopathologist often experiences problems of inadequate funds and staffing.

Parham recommended the use of information output to assess workload of histopathologists. Information output is the number of requests multiplied by the average number of items of information per histopathology report.[2] In this method an item of information is one that has prognostic or therapeutic relevance. The aim of our study was to determine if annual information output had increased during the 17-year period under study, in an Asian setting.

MATERIALS AND METHODS

This retrospective study was conducted in a University Department of Pathology. Two hundred histopathology reports per year at 4 yearly intervals from 1982 to 1998 were analysed. These comprised the first 50 consecutive reports issued in the months of March, June, September and December. The total number of specimens handled annually (TSA), average number of items of information per histopathology report (AIR) and annual information output (AIO) were calculated. When assessing items of information, only features that had prognostic or therapeutic relevance were included. An example is shown in Table 1.

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TABLE 1. Examples of items of information in histopathology reports.

Breast cancer report 1	**Breast cancer report 2**
Conclusion: 1. Infiltrating duct carcinoma 2. Nottingham grade 3	Conclusion: 1. Infiltrating duct carcinoma 2. Nottingham grade 3 3. Size = 4 x 2 x 1 cm 4. No vascular invasion 5. Lymphatic invasion is present
Items of information = 2	**Items of information = 5**

$$\text{AIR} = \frac{\text{Sum of items of information in 200 reports}}{200}$$

Annual information output (AIO) = AIR x TSA

RESULTS

The total number of specimens handled annually, the average number of items of information per report and the annual information output are shown in Table 2. The percentage change in these three indices compared to 1982 are shown in Fig. 1. Table 3 shows the average number of items of information for breast cancer, colorectal carcinoma, liver biopsy for non-neoplastic conditions and skin biopsy reports.

TABLE 2. Total number of specimens handled annually (TSA), the average number of items of information per histopathology report (AIR) and the annual information output (AIO)

	1982	*1986*	*1990*	*1994*	*1998*
TSA	2912	2583	2772	3617	3919
AIR	1.11	1.15	2.21	2.4	3.12
AIO	3232.3	2970.5	6126.1	8680.8	12227.3

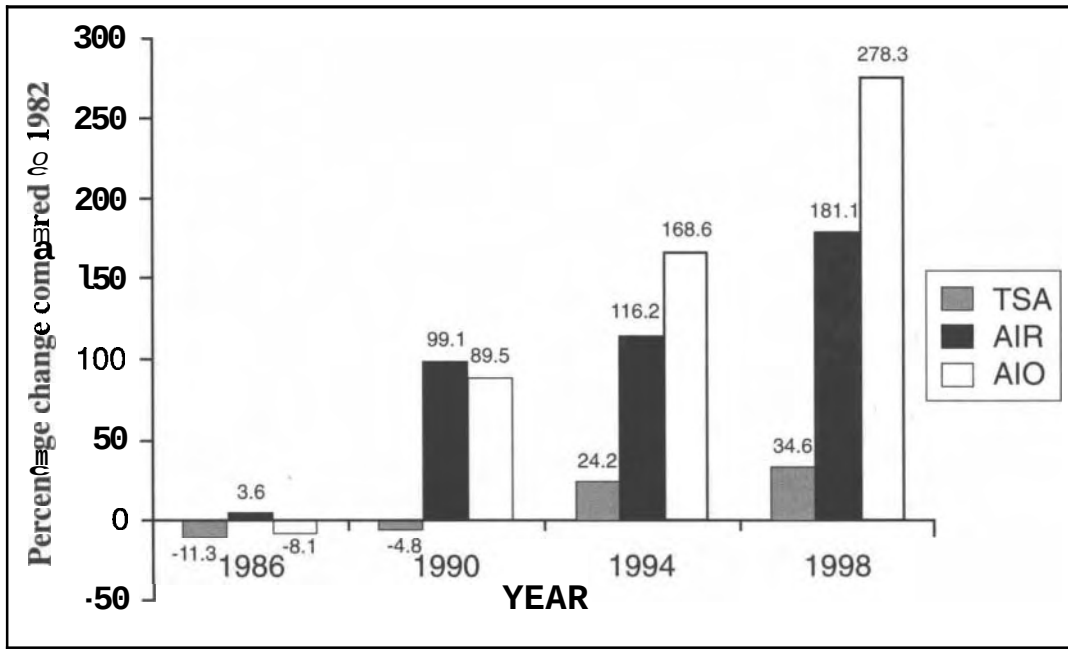

FIG. 1: Percentage change in total number of specimens handled annually (TSA), average number of items of information per histopathology report (AIR) and annual information output (AIO) compared to 1982.

TABLE 3. Average number of items of information per histopathology report (AIR) and percentage increase in AIR compared to 1982, for breast cancer, colorectal carcinoma, liver biopsy for non-neoplastic conditions and skin biopsy reports.

	1982	1986	1990	1994	1998
AIR in breast cancer reports (percentage increase)	1.85	2.00 (8.1%)	4.50 (143.2%)	5.20 (181.1%)	10.25 (454.1%)
AIR in colorectal carcinoma reports (percentage increase)	1.67	2.00 (19.8%)	5.00 (199.4%)	6.25 (274.3%)	6.67 (299.4%)
AIR in liver biopsy reports for non-neoplastic conditions (percentage increase)	1.00	1.33 (33%)	2.55 (155%)	2.60 (160%)	3.83 (283%)
AIR in skin biopsy reports (percentage increase)	1.00	1.06 (6%)	2.06 (106%)	2.10 (110%)	2.28 (128%)

DISCUSSION

This study shows a steady increase in the average number of items of information per histopathology report (AIR) and annual information output (AIO) over a 17-year period. In 1998 the percentage increase in the average number of items of information per report and annual information output were respectively 181.1% and 278.3%. This striking increase in workload will be hidden if evaluation is done only by assessing the total number of specimens handled annually which showed a percentage increase of only 34.6%. In fact in 1990 although the total number of specimens declined by 4.8%, workload as reflected by annual information output increased by 89.5% (Fig. 1). The increase in the number of items of information may be explained by new knowledge and awareness in recent years, regarding the prognostic and therapeutic relevance of certain pathologic features.[2]

With regard to malignancies, international guidelines require the inclusion of grading systems, mitotic counts, comments on involvement of surgical resection margins by tumour and presence or absence of lymphovascular invasion to'narne a few.[3,4] It is therefore not surprising that the number of items of information for reports of breast and colorectal carcinoma in our study, showed increases of respectively 454.1 % and 299.4% in 1998 when compared to 1982. These findings are similar to a study done by Cross and Bull in the United Kingdom, where the percentage increase in items of information per report in mastectomy and colectomy specimens increased by 273% in a 50-year-period.[5] Histopathology reports of some non-neoplastic conditions have also shown a steady increase in information content. This is evident by the increase in information content of liver biopsy reports (Table 3), which is probably due to an increased awareness regarding prognostic and therapeutic implications of pathological information such as grading and staging of chronic hepatitis.[6]

The results of this study show that there is a hidden increase in the workload of the histopathologist in the Asian region, similar to that reported in the West.[2] This increase in workload is not accounted for by assessing the total number of specimens handled alone. If staffing requirements are quantified by the latter, it may result in compromise of reporting standards in order to cope with this hidden increase in workload. If reporting standards are compromised, it will in turn result in compromise of quality of patient care. Although the assessment of annual information output is more time consuming than calculating the total number of specimens handled annually, it is a better indicator of workload as it considers both the total number of specimens and the information content of reports.

We recommend that health administrators in the Asian region adopt annual information output as the method to quantify workload of histopathologists. By doing so they will ensure that cadre allocation of pathologists is assessed without compromising quality of reporting and thereby patient care.

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