RESEARCH ARTICLE

Gleason's Grading of Prostatic Adenocarcinoma: Inter-Observer Variation Among Seven Pathologists at a Tertiary Care Center in Oman

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Abstract

Prostatic adenocarcinoma is the commonest solid malignancy seen in Omani elderly males 60-80 years of age. The Gleason grade is the most widely used grading system for prostatic carcinoma and is recommended by the World Health Organization. A peer review was carried out at the Pathology Department of Sultan Qaboos University Hospital (SQUH), Oman, to assess the quality of reporting at the center. The aim of this study was to determine inter-observer variation among 7 pathologists working at a tertiary care center in Oman. A total of 47 consecutive prostatic biopsies were interdependently reviewed by seven pathologists and the results obtained were compared with each other and the original diagnosis. This peer review indicated a fair inter-observer agreement (0.482) among 7 pathologists in the department, with fair to moderate agreement when the results were compared to the reported diagnosis, comparable to the published literature. Dual and sub-specialty reporting are being instituted to improve the performance in this vital aspect of pathology.

Keywords: Prostate- adenocarcinoma- Gleason's grading

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Introduction

Prostatic adenocarcinoma is the commonest solid malignancy seen in Omani elderly males 60-80 years of age (ministry of health Oman, document)1. Mortality from prostatic adenocarcinoma has declined due to improved screening techniques and monitoring by serum PSA levels. Gleason grade is the most widely used grading system for prostatic carcinoma and is recommended by the World Health Organization (Gleason et al, 1974). It is essential that there should be good inter-observer reproducibility of this grading system as it has important implications in patient management (Allsbrook WC, 2005). However, this is not always achievable as has been reported by several groups.

Fifty consecutive cases of prostatic adenocarcinoma, diagnosed on TRUS biopsy at Sultan Qaboos University Hospital were identified from the hospital information system. Hematoxylin and Eosin stained slides were retrieved from the laboratory archives. Five cases were excluded due to lack of representative material or faded staining. Forty-five cases were circulated among 7 pathologists who reviewed them independently. All the participating pathologists are general pathologists.

The pathologists gave a primary and secondary grade and a final overall score for all the 45 cases. Kappa co-efficient was calculated to look at the concordance between the pathologists. The final score given by all the pathologists was compared with the original diagnosis issued (this was taken as final diagnosis as the patient was treated based on that report). The data was analyzed using SPSS version 20.0. All statistical analyses were done with the help of the Biostatistics department of the College of Medicine & Health Sciences at the Sultan Qaboos University.

The Kappa coefficient for primary grade was 0.6; which means good agreement; for the secondary grade was 0.4; which means fair agreement and for the final score was 0.5 (Table 1) which also translates into fair agreement. When the original report was compared to the final score given by the participating pathologists, Kappa coefficient ranged between 0.5 to 0.7. The best concordance was seen between pathologist 5 and the original report. There were 8 cases where discrepancy was seen among pathologists: these were labeling a lesion grade 3+4 versus grade 4+3 (overall score remained 7). As there was no major clinical implication, it did not mandate alerting the treating clinician. The peer review was presented at the medical advisory committee (MAC) meeting of the hospital as part of quality improvement initiatives of the department.

Vast literature since 1960s has established Gleason score as one of the pathologic factors paramount in

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Table 1. Kappa Coefficient for Final Score

	P 1	P 2	P 3	P 4	P 5	P 6	P 7
P 1		0.4	0.4	0.4	0.4	0.5	0.4
P 2			0.5	0.4	0.5	0.6	0.6
P 3				0.4	0.4	0.4	0.4
P 4					0.6	0.5	0.4
P 5						0.5	0.4
P 6							0.4
P 7							

predicting disease outcome. In fact, the grading system has become so vital that it is often used as an integral part of management and treatment of patients with adenocarcinoma of prostate (Gleason, 1974).

The Gleason's system also prescribed the use of immunohistochemistry for differentiating benign conditions like adenosis from low grade carcinomas by the demonstration of basal layer. It is the grading system incorporated in the current WHO classification of tumors. Centers all over the world should adhere to this protocol for comparative studies on outcomes of treatment. It is obviously critical there should be good inter-observer reproducibility for Gleason's grading worldwide (Grofit, 2008). Several publications exist on this important aspect of reporting of prostatic adenocarcinoma. We compared our results to studies carried out both by general pathologists and those who specialize in urologic pathology (Allsbrook WC, 2008). They suggested that when inter-observer variation was calculated between general pathologists in Japan and USA, the kappa coeffient was in the moderate range of 0.56. It improved considerably after post sign out feedback from urologic pathology expert (Allsbrook WC, 2008).

In another North American study (William C Allsbrook et al., 2001) to calculate inter-observer variation among urologic pathologists; the kappa coefficient was 0.5 to 0.6 (moderate to substantial agreement). There were 8 cases that lacked consensus which was predominantly between scores 3+4 and 4+3 .In a study from Iran, (Abdollahi et al, 2012) studied inter-observer variation on 101 prostate biopsies. The kappa co-efficient was 0.29 which showed overall poor concordance. Singh et al reported inter-observer variation between 21 general pathologists and the overall (Agashe et al, 2011) scores were between -0.11 to 0.82.

This peer review indicates that there is fair inter-observer agreement (0.482) among 7 pathologists in the department. There is fair to moderate agreement when the results were compared to the reported diagnosis (0.5 to 0.7). The results are comparable to published international literature from various centers around the world. Steps have already been taken to minimize inter-observer variability through dual reporting and initiation of sub-specialty reporting by pathologists with interest in GU pathology.

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