

Correlation of MRI - PRECISE Score with Histological Progression in Prostate Cancer Patients

Background

- Prostate cancer is the most common cancer in UK men.
- Active Surveillance (AS) relies on PSA levels and bi-parametric MRI (bpMRI).
- PRECISE scoring system assesses changes in serial MRI scans to monitor disease progression.

In NHS Grampian, Prostate Cancer Radiological Estimation of Change in Sequential Evaluation (PRECISE) scoring system is utilised in MRI prostate reporting to classify radiological changes on serial examination and aid in clinical decision making for patients under AS

- PRECISE score ranges from 1-5, where higher scores indicate disease progression.

Aims and objectives

Evidence from the application of the PRECISE scoring is still scarce and with this study, we aim to correlate PRECISE scoring with histological progression to provide further statistical information for validation of the system and to compare local findings to published data.

Target

Comparison standard/benchmark:

Published sensitivity of 76% cases with PRECISE score ≥ 4 to indicate histological progression.

Indicator

- Distribution of MRI PRECISE score.
- Percentage of cases with post-MRI histological results.
- Percentage of histological progression for each PRECISE score group.

Methodology

- Prospective study including patients on AS for prostate cancer were included.
- Data: MRI PRECISE scores, biopsy or surgical histology, and management plans.
- Data collection period: 20th January 2023 to 26th March 2024.
- Local results compared to published benchmarks.

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Results - 1st Audit Round

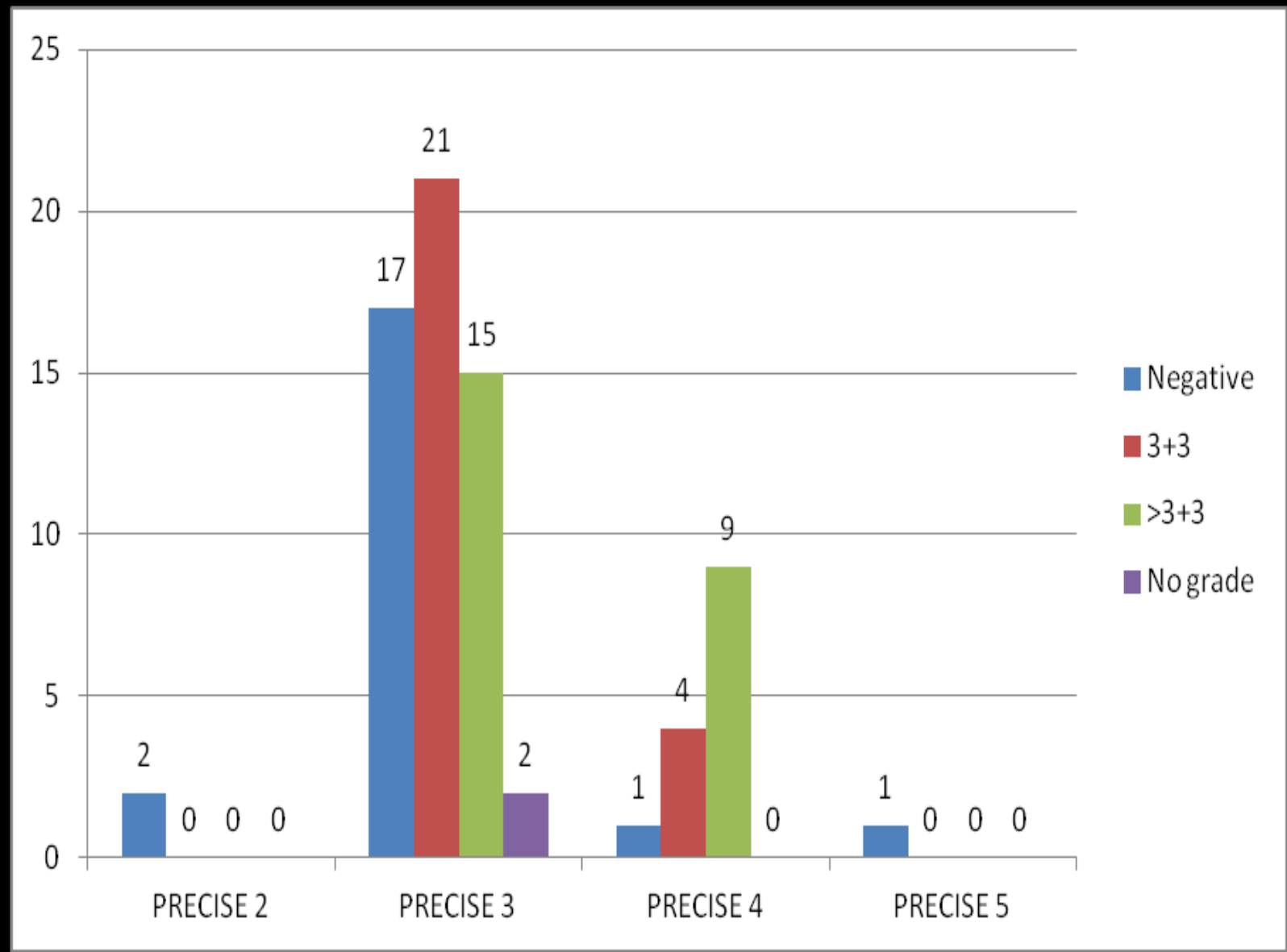
205 MRI examinations performed:

- PRECISE 3: 171 cases
- PRECISE 4: 25 cases
- PRECISE 5: 5 cases

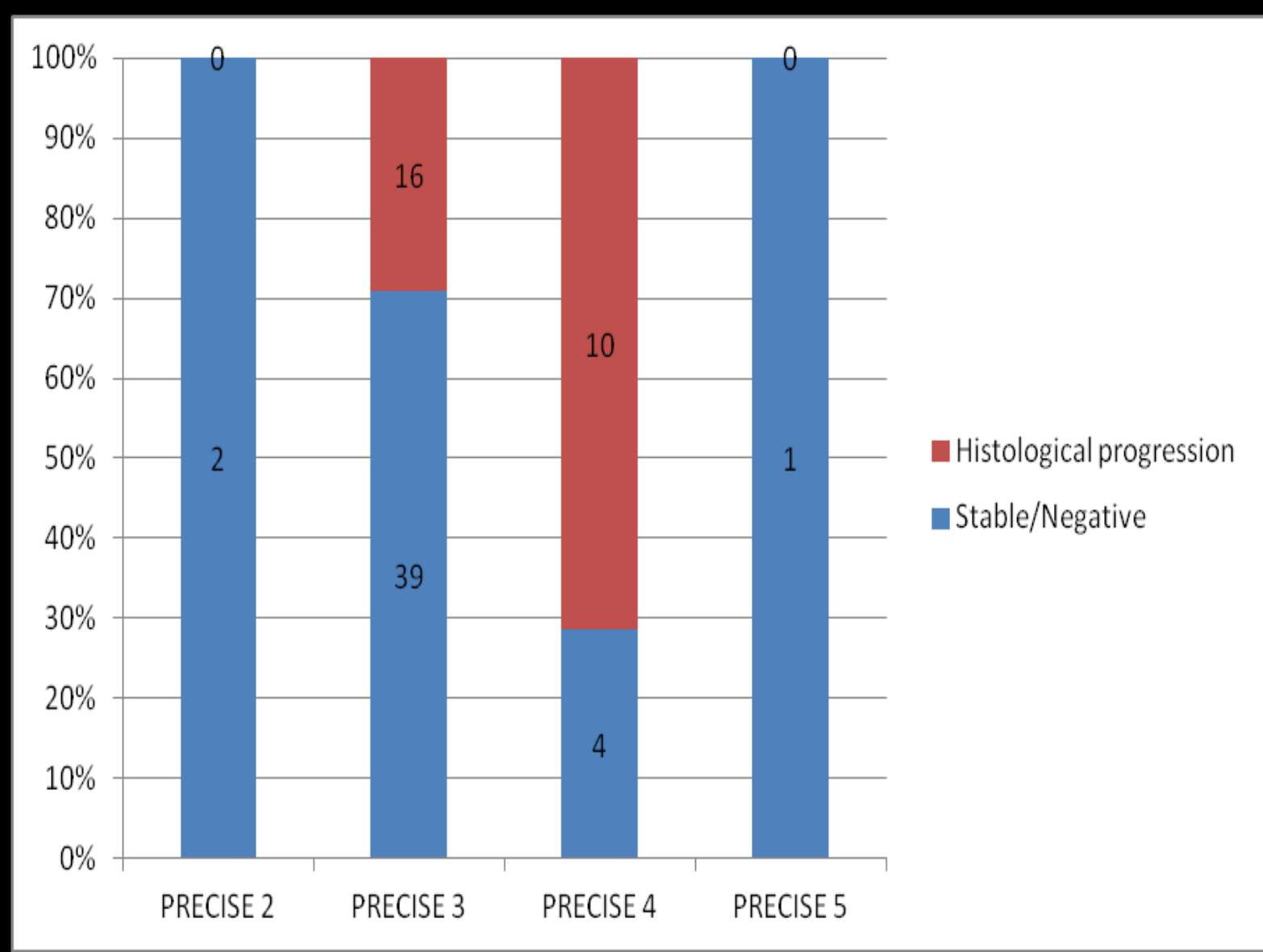
- 77% of PRECISE 4 cases showed histological progression.

Post-MRI histology results are available for 72 cases from this cohort.

- PRECISE score of 2: 2 cases
- PRECISE 3: 55 cases
- PRECISE 4: 14 cases
- PRECISE 5: 1 case



Post-MRI Histology Results



Percentage of histological progression

Discussion

- Most of the MRIs in the study reported a PRECISE score of 3, indicating that low-grade (Gleason 3+3) localized prostate cancer is generally slow growing and suggests appropriate selection of pts for AS. Only (15 out of 55, 27%) of these patient showed progression with the score of 3 indicative of disease stability.
- Patients with PRECISE 4 (radiological progression) on MRI showed a higher proportion of histological progression (10 out of 13, 77%). However, the size of this cohort is significantly smaller than that of the PRECISE 3 group
- PRECISE 5 group is under-represented due to its small cohort size. An even smaller proportion of this group had post-MRI histology results available. Most of these patients (including those with other PRECISE scoring) were initially placed on active surveillance due to previous biopsy proven malignancy but changed to active treatment due to subsequent radiological progression on MRI and a post-MRI biopsy or surgery was not performed.

Discussion (continued)

- The quality of the study was somewhat affected by the cohort size in certain score groups. Although mpMRI of the prostate is frequently performed for monitoring prostate cancer under active surveillance, this is not always followed by biopsy especially for stable appearance scoring PRECISE 3. Some repeat biopsies were performed due to rising PSA which preceded the MRI and these histology results were not considered for this study.
- Overall, PRECISE scoring closely matches histological findings in most instances and serves as a clinically useful tool for directing the management of patients with prostate cancer under active surveillance.

Conclusion & Action Plan

- PRECISE scoring is effective in predicting progression.
- Local results match published sensitivity (77% for PRECISE ≥ 4).

- Action Plan:
 - Larger study population.
 - Include more PRECISE 5 cases.

References:

- Giganti F, Kirkham A, Allen C, Punwani S, Orczyk C, Emberton M, Moore CM. Update on Multiparametric Prostate MRI During Active Surveillance: Current and Future Trends and Role of the PRECISE Recommendations. AJR Am J Roentgenol. 2021 Apr;216(4):943-951. doi: 10.2214/AJR.20.23985. Epub 2021 Feb 3. PMID: 32755219.
- Caglic I, Sushentsev N, Gnanapragasam VJ, Sala E, Shaida N, Koo BC, Kozlov V, Warren AY, Kastner C, Barrett T. MRI-derived PRECISE scores for predicting pathologically-confirmed radiological progression in prostate cancer patients on active surveillance. Eur Radiol. 2021 May;31(5):2696-2705. doi: 10.1007/s00330-020-07336-0. Epub 2020 Nov 16. PMID: 33196886; PMCID: PMC8043947.