Pancreatobiliary Cytopathology: The Use Of The Papanicolaou Society System In The Transition Towards A New Era Of Standardised Reporting

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Background

- Current reporting systems in the UK vary between C1-C5 and Papanicolaou system which is recommended by the Royal College of Pathologists (RCPath), London.[1,2]
- C1-C5 grading[3]

Grade	Features
C1	Less than 5 cytological groups present in sample. Sample obscured by blood and inflammatory cells making assessment suboptimal.
C2	Sheets and single cells with rounded oval nuclei and no significant nuclear pleomorphism.
C3	Small groups of cells showing mild hyperchromasia, irregular chromatin pattern, mild nuclear pleomorphism
C4	Suspicious of malignancy: Small groups of malignant cells showing overlapping nuclei and irregular chromatin pattern.
C5	Hyperchromasia, irregularity of chromatin pattern, overlapping cells, increased nuclear-to-cytoplasmic ratio, irregular nuclear outline, increased size and number of nucleoli

- Papanicolaou Society[4]

Grade	Features
I – Nondiagnostic	No useful diagnostic information present. Any cytological atypia precludes use of this category.
II - Negative	No cytological atypia seen. Sample is adequate.
III - Atypical	Reactive changes, atypia in a low cellular sample, pre-malignant changes or features suggestive but not definitive for a low grade neoplasm
IV_A – Neoplastic (Benign)	Samples recognised to originate from benign entities
IV_B – Neoplastic (Other)	Samples recognised to originate from a pre-malignant or low malignant potential lesion
V - Suspicious	Specimens with features concerning for malignancy but a definitive diagnosis cannot be made
VI - Malignant	Clear malignant morphology present

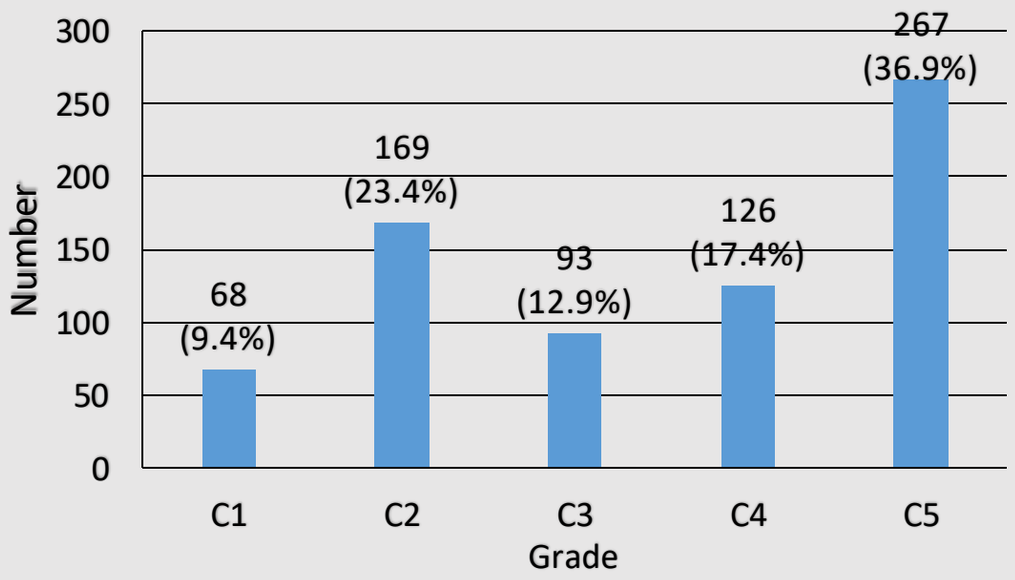
- Our study aimed to compare the emerging Papanicolaou System with C1-C5 grading system in a single UK institution.

Methods

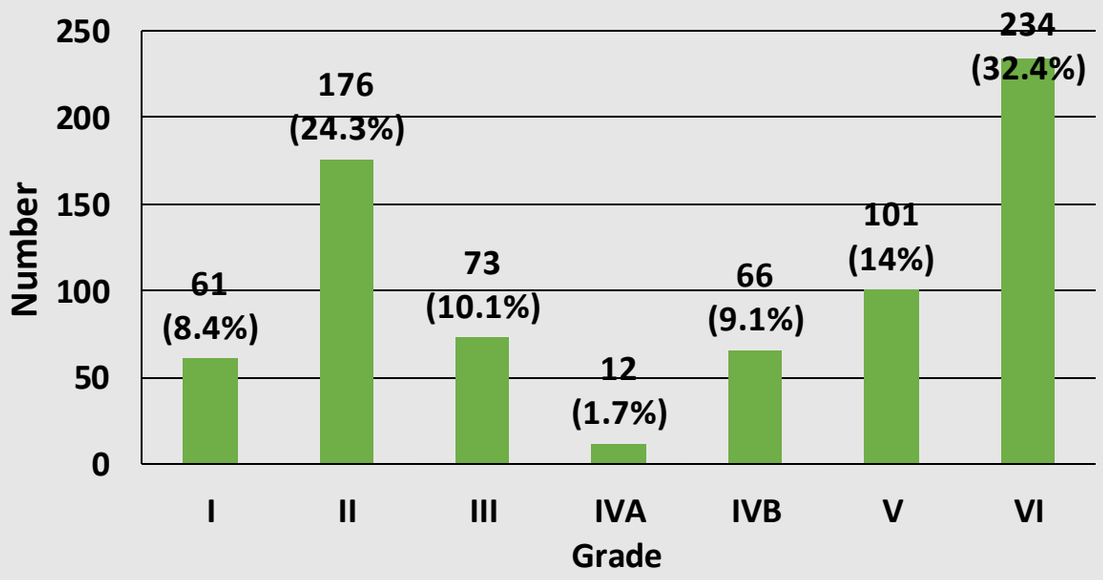
- We retrospectively assessed 723 cases of pancreatobiliary cytology over an 8 year period with corroborative histology available in 187 cases.
- 45 histology cases were subsequently excluded from the statistical analysis for being reported as insufficient or atypical.
- Each case was reviewed by 2 independent pathologists for the reported C1-C5 grade to check for accuracy and then assigned a grade within the Papanicolaou Society of Cytopathology Guidelines for Pancreaticobiliary Cytology.
- We were then able to analyse each grading system for:-
  - ❑ Diagnostic Accuracy
    - ✓ True Positive + True Negative/ Total Number of Samples
  - ❑ Sensitivity
    - ✓ True Positive/ (True Positive + False Negative)
  - ❑ Specificity
    - ✓ True Negative/ (True Negative + False Positive)
  - ❑ False Positive Rate
    - ✓ False Positive/(False Positive + True Negative)
  - ❑ False Negative Rate
    - ✓ False Negative/(False Negative + True Positive)

Results

C1-C5 System



Papanicolaou System



85 case grades were changed when transitioning from C1-C5 to the Papanicolaou System

- C1 – 7 cases were moved to Papanicolaou Grade II – Pseudocyst and mucin
- C2 - No changes in this category
- C3 – 5 cases were moved to 4A and 15 cases were moved to 4B
- C4 – 7 cases were moved to 4A and 18 cases to 4B
- C5 – 33 cases were moved to 4B

Criteria	Result (n=142)
Diagnostic Accuracy	91.5%
Sensitivity	98.3%
Specificity	75%
False Positive Rate	2.5%
False Negative Rate	11.8%

Criteria	Result (n=142)
Diagnostic Accuracy	94.3%
Sensitivity	99.1%
Specificity	79.1%
False Positive Rate	2.5%
False Negative Rate	5%

Conclusions

- Our data adds weight to previous studies and supports adoption of the Papanicolaou system as recommended by the RCPath, London.[5,6]
- Comparable results are achieved compared to C1-C5 whilst reducing the number of cases reported as atypical allows for more informed diagnostic decisions to be made to maximise patient benefit.
- The use of a neoplastic (benign) and neoplastic (other) category may help with clinical decision making however the evidence for this needs to be strengthened as this proves to be a controversial area of diagnosis.

Recommendations

- Adoption of the Papanicolaou Society of Pancreatic Cytology system for reporting as recommended by the RCPath, London.
- The adoption of a standardised system will aid in communication on a national and international level allowing for closer cooperation between centres to improve patient outcomes.
- Further work assessing the upcoming WHO classification of pancreatic lesions is also required to ensure that the most comprehensive and reliable system is in place to facilitate clear working practices in the next era of pathological reporting.

Learning Points

- The increasingly international approach to pathology highlights the need for a standardised reporting system to facilitate safe but effective communication whilst enabling national and international data comparisons.
- An upcoming update to the WHO classification of pancreatic lesions may provide an ideal opportunity to learn from previous pancreatic classifications as we embark on the next generation of pathology.

References

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