

agreement indicate that “pattern recognition” of HRM/EPT was not adequate and highlighted the value of objective metrics in diagnosis of esophageal dysmotility.

Competing interests M Fox consultant for: given imaging, paid instructor for: Sandhill MMS, J Pandolfino: None declared, J Jafari: None declared, D Menne: None declared.

OC-155 NO WAY BACK—IRREVOCABLE ALTERATION OF THE GASTRIC AND OESOPHAGEAL MICRO-ENVIRONMENT FOLLOWING CHOLECYSTECTOMY

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Introduction Background: Loss of the gallbladder reservoir function at cholecystectomy may critically alter the dynamics of bile storage and release. Consequent iatrogenic duodeno-gastro-esophageal reflux (DGER) may be associated with oesophago-gastric adenocarcinoma.

Aims To examine the histological and molecular effects of cholecystectomy-induced DGER on gastric and oesophageal mucosae.

Methods Patients and Methods: In a retrospective study we compared 26 gallstone-free controls with 25 patients pre-cholecystectomy and 29 patients post-cholecystectomy for one or more years. In a prospective study we compared 26 controls with 25 patients before and within 1 year of cholecystectomy. All underwent oesophago-gastro-duodenoscopy (EGD) with biopsies from the antrum, esophagogastric junction (EGJ) and 5 cm above the EGJ. A histochemical bile reflux index (BRI) was calculated and immunohistochemistry was performed for p53 and Ki67.

Results Results: In the retrospective study antral BRI positivity was 11% in controls vs 69% in cholecystectomy patients ($p=0.001$); at the EGJ BRI positivity was 19% in controls vs 41% in cholecystectomy patients ($p=0.032$). p53 was expressed at the antrum in 4% of controls vs 52% cholecystectomy patients ($p=0.001$) and in 19% vs 66% at the EGJ ($p=0.001$). Ki67 was expressed at the antrum in 23% vs 59% ($p=0.001$) and at the EGJ in 19% vs 62% ($p=0.001$). Prospectively, BRI positivity increased from 11% to 36% ($p=0.04$) at the antrum within 1 year of cholecystectomy. Ki67 expression increased from 19% to 48% ($p=0.044$) at EGJ in patients within 1 year of cholecystectomy while p53 remained unchanged.

Conclusion Changes attributable to DGER occur early in the gastric and LES mucosae of patients following cholecystectomy. Ki67 and p53 over-expression suggests that these changes may be precursors of malignant transformation. Such concerning changes suggest that options other than cholecystectomy be considered for patients with gallstones in a functioning gallbladder.

Competing interests None declared.

DDF symposium: “bowel cancer screening”

OC-156 ANALYSIS OF COLORECTAL POLYPS DETECTED IN THE ENGLISH NHS BOWEL CANCER SCREENING PROGRAMME WITH EMPHASIS ON ADVANCED ADENOMA AND POLYP CANCER DETECTED

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Introduction Colorectal cancer is the second most common cause of cancer related death in the UK causing around 16000 deaths each year. Colorectal adenomas are slow growing precursor lesions which progress to cancer. The lesion of most interest in this context is advanced adenoma (size 10+ mm/with 20%–25% villous histology/

high grade dysplasia) as they are of higher risk of progression (2). This study analysed adenomatous lesions detected in NHS BCSP programme.

Methods Data on each patient entering the NHS BCSP programme is prospectively recorded on the national BCSP database. The database was interrogated for all polyps/adenomas found during the period September 2006 to September 2011. The data were analysed with particular focus on detection of advanced adenoma and polyp cancers.

Results A total of 65535 polyps were found, of which 43954 (67.06%) were confirmed histologically as adenomas. 15261 advanced adenomas were detected. These accounts for 34.7% of lesions removed and 23.9% of all lesions detected during screening. 842 polyp cancers were found and removed. 1.9% of the adenomatous lesions removed were polyp cancer. The incidence of villous morphology, HGD and polyp cancer, categorised by adenoma size, are shown in the Abstract OC-156 table 1. The presence of villous histology and high grade dysplasia increases with increasing size of adenoma, whereas villous histology begins to plateau for adenomas over 15 mm in size, the incidence of HGD appears linear up to and beyond adenomas of 45mm in size.

Abstract OC-156 Table 1 Advanced histological feature and cancer in different size groups of polyp

Category	Total number of adenoma	Polyp cancers	% Of polyp cancer	HGD	% Of HGD	Villous histology	% Of villous histology
	18533	31	0.16	152	0.8	1035	5.5
5–9 mm	9577	48	0.5	299	3.1	1781	18.6
10–14 mm	5159	193	3.7	609	11.8	2381	46.1
15–19 mm	3055	181	5.9	567	18.5	1904	62.3
20–24 mm	1540	102	6.6	408	26.4	1048	68.0
25–29 mm	683	70	10.2	211	30.9	511	74.8
30–34 mm	401	48	11.9	139	34.6	299	74.5
35–39 mm	115	21	20	42	36.5	93	80.8
40–44 mm	138	20	14.4	54	39.5	106	76.9

Conclusion 67.06% of all lesions found were histologically confirmed colorectal adenomas. One third of adenomas were advanced adenomas. There is a trend of increase of incidence of cancer and features of advanced neoplasia in adenomas with increasing size. The incidence of AA feature present in lesions below 10mm in size was 10.07%.

Competing interests None declared.

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BSG symposium: “stem cells”

OC-157 PHYSIOLOGICAL CHANGES IN MATRIX STIFFNESS MODULATE HEPATIC PROGENITOR CELL MORPHOLOGY, PROLIFERATION AND DIFFERENTIATION

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Introduction Liver injury is associated with changes in the biochemical and physical properties of the extracellular matrix

(ECM). Hepatic progenitor cell (HPC) activation occurs in the context of severe liver injury. ECM stiffness has been shown to direct differentiation in mesenchymal stem cells. However, the effect of mechanical factors, such as ECM stiffness on HPC responses is poorly characterised. We examined the effect of ECM stiffness on HPC proliferation and differentiation.

Methods Experiments were undertaken using a murine HPC line (BMOL) and primary murine HPCs. Cell culture experiments were performed using a system of laminin-coated polyacrylamide (PA) gel supports of variable stiffness. The stiffness of the PA supports (expressed as shear modulus) was altered across a physiological range (1–12 kPa) corresponding to values encountered in normal and fibrotic livers.

Results Increasing matrix stiffness is associated with enhanced cell spreading. BMOL cells cultured on stiff (12kPa) supports develop prominent actin stress fibres. The projected surface area (mean±SEM) of BMOL cells culture on soft (1kPa) supports was $378 \pm 21 \mu\text{m}^2$ compared to $687 \pm 47 \mu\text{m}^2$ for BMOL cells cultured on stiff (12 kPa) supports ($p < 0.001$). Cell proliferation (Ki67 positivity) increased as a function of increasing matrix stiffness. The proliferative index (PI) of BMOL cells cultured on 2.5 kPa and 12 kPa supports was 7.1-fold ($p < 0.01$) and 11.8-fold higher ($p < 0.001$), respectively, than cells cultured on 1kPa supports. Similarly, in experiments with primary cells, the PI of murine HPCs was 1.7-fold higher ($p < 0.05$) when cells were cultured on stiff (12 kPa) vs soft (1 kPa) supports. Quantitative PCR revealed that BMOL cells cultured on soft (1 kPa) supports up-regulate hepatocyte markers, including; albumin (1.5-fold, $p < 0.01$) and CYP7A1 (1.6-fold, $p < 0.01$), and down-regulate the HPC/biliary marker cytokeratin-19 (0.6-fold, $p < 0.01$), relative to cells on stiff (12kPa) supports. There was no significant change in expression of the biliary epithelial cell markers aquaporin-1 and γ -glutamyl-transferase.

Conclusion Physiological changes in ECM stiffness lead to alterations in HPC morphology, proliferation and differentiation. Increased ECM stiffness (as would be encountered in an injured or fibrotic liver) promotes HPC proliferation and expression of the HPC/biliary marker cytokeratin-19. In contrast, a low-stiffness environment is associated with a reduction in cell proliferation and up-regulation of hepatocyte-specific markers. These results suggest that mechanical factors, such as ECM stiffness might regulate HPC responses following liver injury.

Competing interests None declared.

OC-158 ENDOGENOUS PRODUCTION OF ANTIBIOTICS BY MESENCHYMAL STEM CELLS AND THE POTENTIAL VALUE IN CROHN'S FISTULA HEALING

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Introduction Potent effects of human mesenchymal stem cells (MSCs) on immune responses have been demonstrated in vitro studies and animal models, encouraging further investigations into their clinical value. Studies of MSCs in fistula healing have emphasised the immunosuppressive mechanisms of action however, there has been little focus on their antibacterial activity in this setting. We report here on the antibacterial effects of MSCs against Adherent Invasive *Escherichia coli* (AIEC), reference strain LF82.

Methods Cultured human bone marrow derived MSCs were plated at a density of 5×10^4 cells per square centimetre in 24 well plates and allowed to adhere overnight. Confluent MSCs were preincubated for 1-day with fresh culture medium alone or medium

supplemented with 1 ng/ml TNF α . Cells of passage numbers 4–9 were co-cultured with a calculated 300 Colony Forming Units of AIEC strain LF82 and incubated for 6 h in a humidified CO₂ incubator. Aliquots of the infected medium were taken from each well and plated on LB-agar plates and colonies were counted after overnight incubation. Comparisons were made with aliquots from inoculated wells containing cells that were pre-stimulated with TNF α , in addition to wells that did not contain mesenchymal stem cells. Data analyses were performed using the SPSS statistical package (V.19.0).

Results Each of the wells under test conditions was inoculated with 379 ± 98 CFU at the start of the co-culture time period. In the absence of mesenchymal stem cells, the number of LF82 CFUs in mesenchymal stem cell culture medium had risen to a mean (\pm SD) of 1780 ± 319 [$n=3$], after 6 h. In the presence of passage-4 MSCs, the number of LF82 CFU was significantly reduced by 81.2%, to 335 ± 61 [$n=3$] ($p < 0.05$). When MSCs were prestimulated with TNF, there was a further reduction of CFU levels to 15 ± 6 [$n=3$]. When cells of higher of passage numbers were used, the effects both in the presence and absence of TNF prestimulation diminished such that by passage-8, there was no significant inhibition of bacterial growth.

Conclusion The antibacterial properties of MSCs alongside their tissue regenerative potential make them ideal candidates for use in therapeutic strategies for fistula healing. This study demonstrates that in a proinflammatory environment, MSCs enhance bacterial clearance of AIEC. These findings encourage further evaluation of the antimicrobial effector function of MSCs against other strains suspected to participate in the pathogenesis of Crohn's disease.

Competing interests None declared.

BSG information group symposium & free papers: "Social media and apps: new opportunities, new risks"

OC-159 CONTENT ANALYSIS OF ILLNESS BLOGS POSTED ONLINE BY PATIENTS WITH IBD

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Introduction Illness blogs are online accounts of the course of a disease: they are unsolicited first person narratives, that are publicly accessible allowing author-reader interactivity. Expressive writing improves quality of life and scores in patients with irritable bowel syndrome. We sought to compare the accessibility and contents of illness blogs written by patients with ulcerative colitis (UC) and Crohn's disease (CD): hypothesising that psychological distress, reportedly more common in IBD than the general population, and active disease would be the key reasons for a post.

Methods Using the search terms "Crohn's" and Ulcerative colitis" with Blog" and the internet search engine Google, we identified 12 consecutive UC and Crohn's disease illness narratives. All posts written in the preceding year were included. We then undertook a structured quantitative analysis; including an assessment of the readability of posts using the Flesch reading ease (FRE) score and author-reader interactivity. Semi-qualitative analyses of excerpts of the contents of each post were undertaken using Dedoose software to identify narrative themes: wherever possible, for each post, disease activity was recorded.

Results 1297 and 1009 excerpts were made from 642 and 499 posts from the illness blogs written by patients with UC and CD, respectively. There were no differences in the mean [SD] number of