Introduction Oral iron supplementation is given in a broad range of conditions such as iron-deficiency anaemia but can cause significant gastrointestinal side effects in up to 70% of patients. Constipation and bloating are amongst the commonest side effects. Recent research has shown that increased methane production by archaea in the gut microbiome is related to the slowing of gut transit and constipation, via inhibition of smooth muscle contractility (1). Geobiological research has shown that iron is the most abundantly required metal in the archaeal enzymatic pathway for methanogenesis (2). We hypothesized that oral iron consumption resulted in increased methane production.

Methods A retrospective study of 396 patients who attended The Functional Gut Clinic for a lactulose or glucose hydrogen and methane breath test between June 2018 and January 2019 was carried out. Prior to the test, patients followed a 24hr low fermentable diet and 12hr fast. After providing a baseline breath sample, 10g lactulose or 75g glucose was ingested with 200mL water. Breath samples were taken every 15-minute for 135 minutes. Methane was detected using a sensitive gas chromatography technique and methane producers defined as those producing ≥ 10 ppm at any point during the study. The relationship between iron supplementation and the prevalence of breath methane was analysed via a Chi-squared test and cumulative methane production was analysed via a two-tailed T-test. Due to lack of information about iron supplementation, 59 patients were excluded.

Results Of the patients that took iron supplements, 32% produced methane, versus 17.5% of non-iron takers. A significant relationship was identified between iron supplementation and breath methane ($\chi^2(1, N=337)=4.3885, p<0.05$). Mean cumulative methane production between iron and non-iron takers (536ppm and 376ppm respectively) was statistically significant ($p<0.05$). No adverse events were reported during the test.

Conclusions This preliminary, observational study provides the basis for a new model linking a dietary intervention (ingestion of oral iron supplementation) to a gut microbiome metabolic process (methanogenesis) and a clinical outcome (constipation) which is a common, unexplained side effect of the intervention. This model can be used in prospective studies to determine risk factors for developing GI side effects and test potential therapeutic interventions aimed at disrupting methanogenesis and improving tolerability. These advances would have significant clinical and cost saving potential in a broad group of patients.

REFERENCES

1. Pimentel, M, et al. - *Am J Physiol Gastrointest Liver Physiol* 2006:290
2. Goswami, R, et al. - *Biotech*, 2016: 6:72

PWE-056 ROSIGLITAZONE: A POTENTIAL NEW STROMA TARGETED THERAPEUTIC AGENT IN COLON CANCER

¹Maria Tabuso, ²Raghu Adya, ²Mark Christian, ^{1,2}Ramesh P Arasaradnam. ¹UHCW, Coventry, UK; ²University of Warwick, Warwick, U K

10.1136/gutjnl-2019-BSGAbstracts.380

Introduction The impact of tumour associated stroma on cancer cell invasion and metastasis is an attractive emerging field. Using Nanostring Pancancer pathway we have previously identified pro-fibrotic genes collagen type 1, alpha 1 (COL1A1), fibroblast growth factor 7 (FGF7) and secreted frizzled related

protein 2 (SFRP2) significantly up regulated in human colon cancer peritumour adipose tissue compared to distal adipose tissue. Aim of this study was to evaluate the effect of Rosiglitazone, a peroxisome proliferator-activated receptor gamma (PPARG) agonist known to have anti fibrogenic properties, on COL1A1, FGF7 and SFRP2.

Methods The effect of Rosiglitazone on COL1A1 and SFRP2 was evaluated employing in vitro co-culture systems. 3T3 L1 murine adipocytes were co-cultured with HCT 116 colon cancer cells with and without 1 nM Rosiglitazone for 72 hours. COL1A1, FGF7 and SFRP2 expression were evaluated using quantitative real time-polymerase chain reaction (qRT-PCR). Statistical analysis was performed using paired Student's t-test with a cut-off of p-value <0.05 .

Results Both COL1A1 and SFRP2 resulted significantly down-regulated in co-cultured 3T3 L1 adipocytes treated with Rosiglitazone compared to untreated co-cultured 3T3 L1 adipocytes (20 fold change, $p=0.02$; 3.3 fold change, $p=0.01$ respectively). We did not observe any significant effect of Rosiglitazone on FGF7 expression in treated 3T3 L1 adipocytes compared to untreated adipocytes.

Conclusion Our results have demonstrated significant down regulation of pro-fibrotic genes COL1A1 and SFRP2 in mature adipocytes induced by Rosiglitazone. Rosiglitazone may represent a novel therapeutic agent in stromal targeted therapy in colon cancer.

PWE-057 COLON CANCER CELLS INDUCE 3T3-L1 ADIPOCYTES DE-DIFFERENTIATION THROUGH DOWN REGULATION OF PPARG

¹Maria Tabuso*, ²Mark Christian, ^{1,2}Ramesh P Arasaradnam. ¹UHCW, Coventry, UK; ²University of Warwick, Warwick, UK

10.1136/gutjnl-2019-BSGAbstracts.381

Introduction Adipocyte de-differentiation at the tumour invasive front has been demonstrated in breast, ovarian and colon cancers, although signalling mechanisms are not known. Aim of this study was to evaluate the effect of colon cancer cells on adipocyte de-differentiation.

Methods We investigated interactions between HCT 116 colon cancer cells and murine 3T3-L1 mature adipocytes using an in vitro co-culture system. HCT-116 colon cancer cells were co-cultured with 3T3-L1 adipocytes with and without 1 nM Rosiglitazone, a potent peroxisome proliferator-activated receptor gamma (PPARG) agonist that induces adipocyte differentiation, for 72 hours. Functional and morphological modifications were assessed. Fatty acid binding protein 4 (FABP4), a mature adipocyte marker, and PPARG were evaluated by quantitative real-time polymerase chain reaction (qRT-PCR). Lipid accumulation was evaluated with Oil Red O staining. Statistical analysis was performed using Student's t-test with a cut-off of p-value <0.05 .

Results 3T3-L1 mature adipocytes in co-culture with HCT-116 colon cancer cells exhibited significant down-regulation of FABP4 (5 fold change, $p<0.05$) and PPARG (2 fold change, $p<0.05$). Treatment with Rosiglitazone of 3T3-L1 adipocytes in co-culture with HCT 116 colon cancer cells could not rescue FABP4 expression compared to treated non-cultured adipocytes (5 fold change, $P<0.01$). Red Oil O staining showed marked delipidation of co-cultured adipocytes, with appearance of fibroblast-like cells.

Conclusion Results have shown significant down regulation of FABP4 and PPARG in 3T3-L1 adipocytes induced by HCT 116 colon cancer cells. Rosiglitazone, a potent PPARG agonist, could not rescue expression of FABP4 in 3T3-L1 co-cultured adipocytes. These results provide evidence of colon cancer cell induced adipocyte de-differentiation through PPARG antagonism, which may have a role in sustaining cancer cell survival and progression.

PWE-058 COLONOSCOPY SURVEILLANCE FOR ADENOMATOUS POLYPS: ARE WE DOING IT RIGHT! A RETROSPECTIVE AUDIT

Imran Tahir*, Ben Hicken, Danny Cheung. *Worcestershire Acute Hospitals NHS trust, Worcester, UK*

10.1136/gutjnl-2019-BSGAbstracts.382

Introduction Colorectal cancer (CRC) is the third most commonly diagnosed cancer worldwide. The identification of colonic polyps can reduce CRC mortality through earlier diagnosis and removal of polyps: the precursor lesion of CRC. Following the initial colonoscopy, finding and removal of a polyp, some patients are at increased risk of developing CRC in the future. This is the rationale for post-polypectomy surveillance colonoscopy. Not all polyps seen are adenomas with potential of malignant transformation. The potential benefits of surveillance procedures must be weighed against the burden of colonoscopy: resource use, the potential for patient discomfort, and the risk of complications. The aim was to assess the practice for polyp surveillance against gold standard BSG guidelines based on polyp number, size and histological features.

Methods A retrospective audit of colonoscopies performed in Worcestershire Acute Hospitals NHS Trust in 2017 where polyps were reported. Patients were excluded if cancer was identified, a duplicate procedure performed or they were on another surveillance programme. Colonoscopy reports, histology and clinic letters were reviewed to assess planned follow-up and compliance.

Results 1378 colonoscopies reported polyps. 260 patients were excluded. 1118 patient notes were reviewed. 674 men (60%) and 444 females (40%) were assessed with an average age of 67. 965 (86%) were compliant with BSG guidelines. 153 (14%) patients were not compliant. Of those not compliant, 16 (10%) should have been screened more frequently and 102 (67%) should have received less frequent colonoscopy follow-up. 35 (23%) patients did not require any follow-up as histology did not demonstrate an adenoma incurring a cost implication of £16,275 to the trust (£465 tariff per procedure).

Conclusions The results provide insight into the importance of appropriate surveillance. It highlights the implications of unnecessary procedures in terms of costs, psychological stress and risks associated with the procedure. Of those not requiring follow-up it was apparent the endoscopist was predicting the follow-up timescale prior to receiving the histology report, commonly mis-identifying hyperplastic polyps as adenomas. The predicted size of the polyp also varied between endoscopist and histologist. Keeping a record of surveillance patients and filtering out un-necessary procedures may reduce this risk.

PWE-059 qFIT IS A VALUABLE TRIAGE TOOL FOR SYMPTOMATIC COLORECTAL PATIENTS

Michelle Thornton*, Laura Herron, Ian Godber, Martin Downey, Hakim Benyounes. *Nhs, Wishaw, UK*

10.1136/gutjnl-2019-BSGAbstracts.383

Introduction To prospectively assess the predictive value of qFIT in symptomatic colorectal patients

Methods Following a pilot in 2013, all symptomatic colorectal patients referred to secondary care were required to provide a stool sample for qFIT testing. A qFIT result >9.9 was deemed positive. Patients were clinically reviewed or investigated dependent on symptoms and fitness. A prospective database allowed for electronic case note and GP record review of all patients in December 2018. The database was cross-referenced with the colorectal cancer database.

Results Between July 2013 and September 2018, 4425 patients were tested, 2891 negative (65%). Data is provided on all patients with complete colorectal investigations or no investigations but greater than 6 months validated clinical follow-up. Of the 2443 negative patients (85%) with complete data, 16 colorectal cancers (cra), 11 high risk adenomas (HRA), 40 inflammatory diagnoses (IBD) and 151 low risk adenomas (LRA) were diagnosed. The cumulative NPVs were 99.3%, 98.9%, 97.3% and 91.1% respectively.

Of the 1477 positive patients (96%) with complete data, 99 cracs, 22 HRAs, 66 IBD and 202 LRA were diagnosed. The cumulative PPVs were 6.7%, 8.2%, 12.7% and 26.3% respectively. In those patients with a qFIT >399 (n=396) 51 cracs, 6 HRA, 19 IBD and 45 LRA were diagnosed, giving cumulative PPVs of 12.9%, 14.4%, and 30.6%.

Conclusions qFIT is a valuable tool to safely triage patients. The result allows for priority access to resource limited investigations and can help avoid risk in patients who test negative.

PWE-060 CT COLONOGRAMS IN ELDERLY PATIENTS, A SAFE AND ACCURATE COLONIC EXAMINATION

Neel Raja, Michael Adeleye, Bhavini Billimoria, Ajay Verma*. *Kettering General Hospital NHS FT, UK*

10.1136/gutjnl-2019-BSGAbstracts.384

Introduction In Kettering General Hospital (KGH) we perform almost 500 CT colonograms (CTCs) annually for patients who; do not want, are unable to tolerate, or have failed a colonoscopy (which is considered the "gold standard" colonic examination). The most common reasons for CTC are iron deficiency anaemia, and change in bowel habit, often with the aim of detecting colorectal cancer (CRC).

We have seen an increase over time, in the use of CTC in elderly patients, as a first line investigation. With an ageing population, we explore the significance of performing this examination, in an elderly population who may not be suitable for further investigation/intervention.

Methods We reviewed 1479 patients who had undergone a CT Colonogram between October 2015 and October 2018. Of these, we focused on patients aged ≥80 at the time of scanning. CTC reports were analysed and categorised into those with positive, indeterminate findings, and those with no significant findings. All patients ≥80 years old were followed up (via their electronic records) to observe their outcomes.