While comparing the biochemical profile of euthyroid thalassemics (n=35) to hypothyroid thalassemics (n=15) we found that the serum ferritin level of hypothyroid cases (3394.46 ± 1169.11 ng/L) was comparable to that of euthyroid cases (3195.68 ± 1220.06 ng/L). Serum bilirubin, transaminases, hemoglobin and transfusion parameters were also comparable in these two groups (Table II).

We found no significant correlation between serum TSH level and iron overload, transfusion frequency, transaminases, serum bilirubin level among euthyroid and hypothyroid thalassemia patients.

Thyroid dysfunction has been variably reported in thalassemia patients[7,8,9]. Subclinical hypothyroid-dism was observed in 30% of thalassemia patients in the index study. Although we found no case of clinical hypothyroidism in our study group, it was reported in 6.9% by Agrawal et al[7], 4% by Zerves et al[10], 18.3% by Morgo et al[8], and in none, like in the index study[9].

We found no correlation between thyroid dysfunction and age, amount of blood transfusion, liver dysfunction or degree of iron overload. Similar results have been documented[11]. Jain et al, observed that thyroid dysfunction was not related to age, sex, hemoglobin levels and country of origin, but transfused iron load (units/kg/year) was higher in patients with hypothyroid function, however, the difference was not statistically significant[13]. We found that thyroid dysfunction did not correlate with serum ferritin level. Similar observations have been made by others[12,13,14].

We found no significant worsening in thyroid profile in thalassemia cases over the one year of study; however, Fisola et al, found that proportion of hypothyroidism increased from 8.4% to 13.9% over the period of 12 years in thalassemics[14]. The follow- up period of one year in the index study was possibly not long enough to pick up worsening thyroid status and a longer follow-up is recommended.

To conclude we documented hypothyroidism among a significant proportion of thalassemia patients. As pharmacological treatment for hypothyroidism is readily available, it is important to monitor thyroid function in these patients and institute prompt therapy when indicated.

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Gastric symptoms and quality of life

Gastrointestinal symptoms are common in the adult and elderly populations in North America, Europe, UK and Asia. The prevalence of upper gastrointes-tinal symptoms in Europe ranges from 25-35% and for the lower gastrointestinal symptoms from 3-22%. It is estimated that up to 40% of adults in the U.K. suffer from gastrointestinal symptoms in any

one year[1]. In Asia–Pacific region, the dyspepsia, reflux and heart burn prevalence rate is between 10-20%.

The digestive symptoms are one of the most common and frequent symptoms being reported by the patients[2]. It is difficult to measure their effects on quality of life even for clinicians[2]. The gastrointes-tinal disorders have a definite effect on the quality of life including psychological well-being and these effects are at times higher than any other common chronic illnesses[3]. These patients have more chances of serious mental illnesses and are more at risk of serious mental disorders than the patients of heart disease, diabetes, asthma and arthritis[3].

The effect of gastrointestinal disorders on quality of life is not related to one symptom or disease but studies have shown that there are a number of gastric diseases in which general well-being particularly psychological well-being are markedly decreased when compared with normal populations[4]. Interes-tingly there is a marked difference in severity and intensity even between individual gastrointestinal symptoms and diseases. Even some common symptoms like bloating, nausea, vomiting, epigastric pain, weight loss, heart burn, altered bowel habit showed variations etc[5,6]. The gastric symptoms and quality of life also shows variation with age and gender[6,7].

Literature reviews have shown there is no research to show the effect and relationship of all components of gastric symptoms with different quality of life instruments. This provide us with a very strong rationale to conduct a study which can determine the relationship of gastric symptoms and quality of life and can also determine the effect of age and gender on the quality of life.

We conducted a secondary analysis on a pragmatic randomized controlled trial with repeated measurements named Self-assessment of Health And Illness: RCT IN Neath Gastroenterology Unit "SHAIRING". The study was conducted in Gastroenterology Department at Neath Port Talbot Hospital clinic in UK. The participants (302; males 132, females 170) were recruited from 28 July 2006 to 31 January 2007 after informed consent. The ethical approval was sought prior to start of study by School of Health Care Sciences Research Ethics Committee, University of Wales, Bangor, UK. The inclusion criteria were all patients of any age and gender presenting to gastroenterology clinic with any gastric complain, fluent in English and were able to be followed for three months. The exclusion criteria were complain other than gastrointestinal in origin, taking part in any other study or were seriously compromised ASA status 4+.

The GSRQ (Gastro Symptom Rating Questionnaire) questionnaire had four main components: Upper Abdominal Symptoms (UAS), Lower Abdominal Symptoms (LAS), Wind & defecation. It contained 25 questions. It has the advantage of not relying on past memory as the questions related to only past 12 weeks were included. It was developed and validated in a study by Cheung et al (2006)[8]. The outcome variables of our study were quality of life assessment measured from quality of life instruments (SF-36). SF-36 was also divided into physical (PCS) and mental component scales (MCS).

The statistical software used for analysis was SPSS14. The quantitative variables used were age, four components of GSRQ & QOL instruments (SF-36 PCS & MCS). The only qualitative variable was gender reported in proportion or percentage. The statistical methods used were Pearsons, Spearmans rho correlation, applied to determine the relationship between the four components of GSRQ (UAS, LAS, wind and defecation) and quality of life instrument SF-36 PCS and MCS.

The descriptive statistics showed that mean age of the patients were 56.04 ± 16.69 with maximum and minimum values of 16 and 91 respectively. There were 132 (43.7%) males and 170 (56.3%) females in our study. The mean scores of UAS were 20.67 ± 19.79, LAS were 35.64 ± 32.47, wind 45.53 ± 26.33, defecation 21.32 ± 18.99, SF-36 PCS 39.86 ± 11.80 and MCS were 43.19 ± 12.94 (Table I).

Table I: Descriptive statistics

Variable	Mean score
UAS	20.67 ± 19.79
LAS	35.64 ± 32.47
Wind	45.53 ± 26.33
Defecation	21.32 ± 18.99
SF-36 PCS	39.86 ± 11.80
SF-36 MCS	43.19 ± 12.94

Overall the analytical results showed statistically significant negative correlation between gastric symptoms (components) and quality of life ($p<0.05$) except for lower abdominal symptom and SF-36 PCS ($p>0.05$).

The correlation between UAS & SF-36 PCS and MCS shows significant negative relationship ($p<0.05$). The correlation between wind & SF 36 MCS and PCS also showed significant negative

relationship ($p<0.05$). Similarly the correlation between defecation & SF 36 PCS is also signify-cantly negative ($p<0.05$). However, the correlation between LAS & SF 36 PCS was insignificant ($p>0.05$) and significantly negative between LAS and SF 36 MCS ($p<0.05$) (Table II).

The overall relationship between UAS, LAS, wind and defecation with quality of life instruments showed that as scores of UAS, LAS, wind and defecation increases the quality of life instruments (SF 36 PCS and MCS) decreases, meaning more UAS, LAS, wind and defecation problems worse quality of life. These results were in line with the findings of previous study where it was shown that gastric symptoms like bloating, nausea, vomiting, heart burn, regurgitation are associated with lower PCS and MCS (quality of life instruments)[6].

Table: II Relationship between gastric symptoms and quality of life:

GSRQ component	Generic QOL instruments	Pearson correlation	p value
UAS	SF-36 PCS	-0.290	<0.001
UAS	SF-36 MCS	-0.172	0.003
LAS	SF-36 PCS	-0.049	0.405
LAS	SF-36 MCS	-0.134	0.022
Wind	SF-36 PCS	-0.271	<0.001
Wind	SF-36 MCS	-0.278	<0.001
Defecation	SF-36 PCS	-0.215	<0.001
Defecation	SF-36 MCS	-0.184	<0.001

GSRQ= Gastrointestinal symptom rating questionnaire; LAS= Lower abdominal symptoms; UAS=Upper abdominal symptoms

Strine, Chapman and Flowers (2007) had also shown that patients with low GI disorders have impaired HRQL than without GI disorders and even have 1.8 times higher chance of having serious mental illness[3]. The dyspeptics (comprising mostly of UAS and wind problems) and those with delayed gastric emptying have lower HRQOL scores (using SF-36) and thus lower quality of life. Similarly esophagitis, gastric ulcer and duodenal ulcer have decreased general well-being than those who are healthy individuals. These are important findings as it confirms that all the main gastric problems (e.g. nausea. vomiting, heartburn, regur-gitation) and symptoms (included in GSRQ) has an adverse impact on quality of life and therefore should be given equal importance by the general clinicians and health policy makers.

The only possible limitation of the study is as study was conducted in patients that visited the gastroenterology clinic and not in community; therefore it is possible to miss many cases which do not have any severe gastric problem or having impaired quality of life. So these results could not be integrated into overall community. But as our target population was all those patients that presented with gastric complains to the gastroenterology clinic, thus avoiding potential source of bias

These results clearly showed the adverse effect of gastric symptoms on quality of life. This study suggests that more research should be conducted especially focusing on age and gender relationship with gastric symptoms and different quality of life instruments to further explore their relationships.

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