

Research Article

Study evaluating chronic abdominal pain and functional abdominal pain syndrome

Sangeeta Gupta^{1*}, Gaurav Gupta², Prateek Sharda², Karan Mittal²

¹Department of Physiology, ²Department of Surgery, M.M.I.M.S.R., Mullana-Ambala, Haryana, India

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*Correspondence:

Dr. Sangeeta Gupta,

E-mail: drsangeeta77.65@rediffmail.com

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ABSTRACT

Background: Chronic abdominal pain (CAP) is a prevalent condition with a wide etiology and is often associated with significant health care utilization. A functional diagnosis, particularly, Functional abdominal pain syndrome (FAPS) is more challenging and has been a less extensively studied condition in adults as compared to other common functional gastrointestinal disorders. Hence, this study attempts to formulate a definite line of investigations, study various causes of chronic abdominal pain and to evaluate FAPS, in a population from Central India.

Methods: 100 patients in the age-group of 10-60 years with chronic abdominal pain were selected. A careful history, clinical examination and investigations were performed and final diagnosis was made on the basis of the available data.

Results: Eighty-nine out of hundred patients were found to be having some organic disorder causing CAP while eleven had functional gastrointestinal disorders. FAPS was diagnosed in three patients on the basis of Rome III diagnostic criteria while one had unspecified functional abdominal pain.

Conclusions: CAP is a multifactorial condition yet, a thorough history coupled with a complete physical examination and investigative profile help to a great extent in diagnosing the cause. FAPS should be diagnosed on the basis of a careful clinical history and characteristic pain behaviour during physical examination. A cost-effective and conservative approach should be adopted for investigations. Unlike the organic causes, FAPS should be treated with a biopsychosocial approach with a variable combination of pharmacological, cognitive-behavioural and psychological interventions.

Keywords: Chronic abdominal pain, Functional abdominal pain syndrome

INTRODUCTION

Chronic abdominal pain (CAP) is one of the most commonly encountered complaints in primary-care clinics, subspecialty as well as gastroenterology clinics. The diagnosis and management of chronic abdominal pain is often a challenging problem owing to its wide etiology and poor sensitivity of history and physical examination of the patients. It requires careful clinical interrogation in addition to diagnostic testing to discern if the diagnosis is indeed the cause of the patient's chronic pain. CAP is characterized by chronic, recurrent or continuous abdominal discomfort, defined as three or

more episodes of abdominal pain severe enough to affect daily activities occurring over a period of at least three months.¹ The etiology of CAP ranges from various organic to functional causes. Organic causes can be of anatomical, neurogenic, musculoskeletal or metabolic in origin. Functional abdominal pain (FAP) is a more challenging problem and is difficult to diagnose and manage as there is no clear organic cause that can explain the underlying symptoms. FAP forms a distinct category in the classification of functional gastro-intestinal disorders. FAP includes functional abdominal pain syndrome (FAPS), defined according to the Rome III diagnostic criteria and is characterized by chronic,

recurrent or continuous abdominal pain for at least six months that is poorly related to gut functions or other physiological events, with some loss of daily functioning. FAP also includes unspecified functional abdominal pain, the condition which fails to meet the criteria for FAPS.²

The prevalence of chronic abdominal pain is unknown but the incidence of unspecified chronic abdominal pain is suggested by the epidemiological data to be around 22.9 per 1000 person-years. Abdominal pain was reported in 25% of the adult population during cross-sectional surveys.³⁻⁵ The prevalence is equal across different age groups, ethnicity and geographical regions.^{6,7} Sandler et al. suggested the prevalence of abdominal pain and discomfort to be 22% and women were found more likely to report than men.⁷⁻⁹

Epidemiological studies suggest that the vast majority of patients with chronic abdominal pain have functional gastro-intestinal disorders such as irritable bowel syndrome or functional dyspepsia. However, the pain associated with these disorders is non-specific and can resemble or co-exist with organic disorders.^{7,10-13} Functional gastrointestinal disorder (FGID) is a multifactorial condition that results from a complex interaction between psychosocial and physiologic factors via the brain-gut axis.^{14,15} Gastro-intestinal symptoms in pain-related FGIDs have different features. For, instance, in Irritable bowel syndrome (IBS), abdominal pain is characterized by two of the following three features: relieved with defecation and/or onset associated with a change in frequency of stools and/or onset associated with a change in the form of stools. Epigastric pain syndrome in Functional dyspepsia is defined by moderate and intermittent pain or burning sensation localized to the epigastrium, not generalized or localized to other abdominal or chest areas, not relieved by defecation and not fulfilling the criteria for gall-bladder and sphincter of Oddi disorders.¹⁶

The prevalence rates of these pain-related FGIDs like Irritable bowel syndrome (IBS) is 10-20 %, that of functional dyspepsia is 20-30% and that of Functional gall bladder and sphincter of oddi disorders is 7.6-20.7 %.¹⁷⁻¹⁹ The epidemiology of FAPS is limited due to the lack of available data as well as difficulty in establishing the diagnosis. Reported prevalence figures from North America ranges from 0.5 to 2% and do not differ from those reported in other countries. The disorder is more common in females.^{7,15,20} The data for FAPS in Indian population is sparse as most of the studies have evaluated abdominal pain in paediatric age-group only or common pain-related FGIDs other than functional abdominal pain have been studied extensively. Despite the low prevalence of the condition, the patients with FAPS tend to have many specialist referrals, diagnostic tests and major abdominal and pelvic surgeries. Evaluation of FAPS, therefore, becomes essential, with the syndrome imposing significant economic burden owing to the utilization of significant health care utilization by the

patients. Patients have high work absenteeism, are unresponsive to standard medical therapy and the condition is associated with high morbidity owing to its relation with psychological disorders. Hence, in the present study, we attempted not only to formulate a definite line of investigations in diagnosing CAP, a condition with a vast etiology, but also to evaluate and manage the patients with functional abdominal pain, a debilitating chronic abdominal pain disorder with associated psychosocial disturbances.

METHODS

It was a cross sectional study conducted on a population from Central India. One Hundred patients, visiting Surgery out-patient department and those admitted in different wards of the hospital for chronic abdominal pain were selected over a period of one year. Written informed consent from the patients was obtained. The data was collected by taking patient's history, clinical examination and investigations charted in the proforma. This study has been approved from the Institutional Ethical Committee.

All the patients with chronic abdominal pain for more than three months duration were included in the study. However, patients with proven diagnosis for abdominal pain and follow up cases were excluded from the study. Patients were divided into three groups: A (<18 yrs.), B (18 to 40 yrs.), C (>40 years). Detailed history was taken about the pain regarding its location, type, duration, timing, frequency and factors that worsen or relieve the pain. To evaluate functional abdominal pain and other functional GI disorders, a careful history, taking into account the chronology of pain events for example, relation to surgery, relation to physiologic events, and about the occurrence of adverse or traumatic life events was obtained. Also, attention was paid to the way, the pain events were described by the patients. Past medical history included Diabetes mellitus, Hypertension, Tuberculosis, nature and timing of any abdominal surgery, the results of previous investigations and treatment received. Presence of affective disorders like anxiety and depression and somatoform disorders was sought for, owing to the fact that FAPS is known to be associated with psychological disturbances. Drug history included details concerning prescription and illicit drug use as well as alcohol and other addictions. Family history of sickle cell trait or disease, familial Mediterranean fever, and porphyria were enquired upon.

Concomitant GI symptoms were enquired such as nausea, vomiting, heart burn, bloating, post-prandial fullness, haematemesis, malaena, anorexia, weight loss, and mucus or blood in the stool. Bowel symptoms, such as diarrhea, constipation and changes in stool consistency, color, or elimination pattern were particularly asked. Hepatobiliary, pancreatic, genitourinary tract and gynecological symptoms were specifically enquired upon. A general examination was done to look for the presence of pallor, icterus, lymphadenopathy, skin rashes

and peripheral edema. Abdominal examination was also done to find the areas of tenderness, hernial sites, scars, sinuses or fistulas. Presence of masses or organomegaly were noted, per rectal examination was done wherever indicated. For the evaluation of FAPS, during examination, presence of abdominal scars were sought for. The pain behavior of the patients was noted by: closed eye sign, diminution of pain during distraction of the patient and during firm application of the stethoscope over the previously reported painful area of the abdomen. Also Carnett's test was performed to exclude musculoskeletal pain, which included instructing the patient to sit-up against the resistance of the examiner's hand over the patient's forehead and the painful area was palpated before and after the tensing of the abdomen.^{21, 22}

All the patients underwent necessary investigations including urine analysis, CBC (complete blood count), ESR (erythrocyte sedimentation rate), peripheral smear and blood sugar. Liver function tests, kidney function tests, serum amylase, serum lipase, sickling test were done depending on the patient's history and findings. All the patients underwent Ultrasonography (USG) of the abdomen and pelvis by experienced radiologists. Stool examination was done in cases with GIT symptoms. Other special investigations like Contrast enhanced CT scan of the abdomen and pelvis, upper GI endoscopy or colonoscopy and Barium studies were also done as indicated. Magnetic Resonance Cholangio Pancreatography (MRCP), Endoscopic Retrograde Cholangio Pancreatography (ERCP), diagnostic laparoscopy were done in few cases.

The data from the 100 patients was recorded in Microsoft excel 2007 and findings were tabulated accordingly by using statistical software SPSS version 19.

RESULTS

In the present study, 54% patients were males and 46% were females (Graph 1) (Figure 1). Most of the patients (53) were in the age group of 18-40 yrs. It was found that maximum patients had pain for the duration of 3-6 months (53%), whereas (26%) had CAP for more than 6-12 months and (21%) for more than 1 year (Table 1). Much higher percentage of adults had some type of chronic GI symptoms besides pain, including non-ulcer dyspepsia and various other bowel disturbances. Maximum number of patients (twenty-eight) had pain in the upper abdomen i.e. epigastrium and hypochondrium indicating the presence of gastritis, reflux esophagitis, gastric or duodenal ulcer; cholelithiasis, pancreatitis and hydatid cyst of liver in a few. Lower abdominal pain (twenty-five patients) and pelvic (sixteen patients) formed a large group, as amoebiasis, worm infestations and gynecological causes were the underlying source. Dull aching pain (46%) was the commonest type of pain because it is found in more than one disease. Burning pain (24%) in the epigastrium indicated peptic diseases. Colicky abdominal pain (25%) was suggestive of colitis,

biliary tract diseases, renal/ureteric stones and worm infestation (Table 1).

Table 1: Distribution of patients according to the duration of illness, location of pain and the character of pain.

		No. of cases
Duration of illness	3-6 months	53
	7-12 months	26
	>12 months	21
	Total no. of cases	100
	Upper abdomen	28
Location of pain	Lower abdomen	25
	Periumbilical	18
	All over the abdomen	27
	Pelvic	16
	Total no. of cases	114*
Character of pain	Colicky	25
	Dull aching	46
	Burning	24
	Others	05
	Total no. of cases	100

*Few patients had pain in more than one area of abdomen.

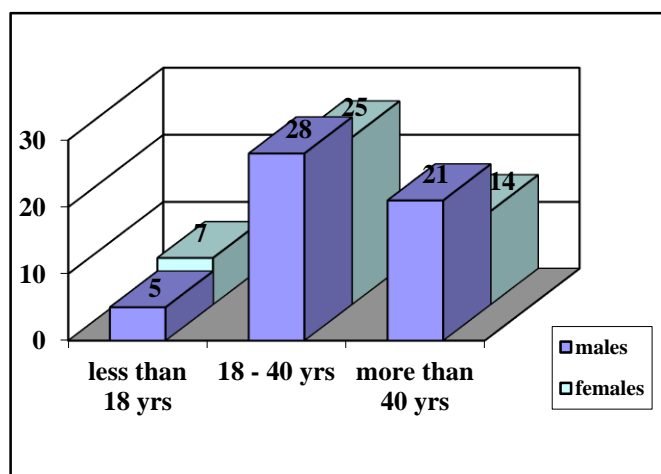


Figure 1: Age and sex distribution of patients having chronic abdominal pain.

Fourteen patients had history of various abdominal surgeries including appendectomy, hysterectomy /tubectomy, surgery for stones, laparoscopy etc. When the patients were examined, maximum patients had vague epigastric tenderness (twenty-seven patients) suggestive of upper GI disorders. Twenty-five patients had pain in the left lumbar region; fifteen had pain in right lumbar region suggestive of renal pathology. Seventeen cases had pain in umbilical region and hypogastrium. Twelve had pain in right hypochondrium and right iliac region,

seven in left hypochondrium. Left iliac region and whole abdomen was the site of tenderness in three patients each.

Table 2: Distribution of patients with positive findings with different imaging modalities.

Imaging modality	Positive finding	No. of cases*
Ultrasonography	Kidney stones	13
	Ureteric stones	8
	Cholelithiasis	2
	Hydronephrosis/mass kidney	6
	Growth in upper GIT	4
	Growth in lower GIT	3
	Organomegaly	15
	Cysts (simple/parasitic)	5
	Mesenteric lymphadenopathy	8
	Prostatomegaly	3
	Ovarian/uterine cysts	3
	Others	12
	Total	74/100
		No finding
CT scan	Carcinoma stomach (GE junction, Body, Pylorus)	4
	Pancreatitis (acute fluid collection, strictures, pseudo cyst)	2
	Colorectal Carcinoma (caecum, ascending, transverse, descending)	2
	Hepatobiliary (Ca liver, gall bladder, cysts, stones)	6
	GUT (Renal cell carcinoma, hydronephrosis, ca prostate)	6
	Gastrointestinal stromal tumour (GIST)	1
	Para-aortic lymphadenopathy	1
	Total	22/24
	No finding	2
Upper GI endoscopy	Oesophagitis	2
	Carcinoma oesophagus	1
	Carcinoma stomach	3
	Gastritis	8
	Gastric ulcer	1
	Duodenal ulcer	1
	H. Pylori positive	8
	Total	19/22
	No finding	3/22
Barium enema	Carcinoma stomach	1
	Carcinoma caecum	1

* Few patients had more than one finding.

On the basis of routine haematological investigations sixty-seven patients had anaemia with sixty-four patients having mild (8-12 gm. % Hb) and three had moderate anaemia (5-8 gm. % Hb). TLC (Total leucocyte count) was raised in sixteen patients whereas ESR (erythrocyte sedimentation rate) was raised in four patients. Urine examination revealed presence of pus cells in twenty-three patients, RBCs in five patients and albumin in eight patients. Higher incidence of urinary infection could be

due to high rate of urolithiasis. Additional laboratory investigations were chosen on the basis of the history and physical examination. These investigations included stool testing for parasites, liver function tests, kidney function tests, serum amylase and lipase. Stool examination was positive (ova, cyst, occult blood) in 5 patients out of fifteen examinations done. Twelve patients had deranged KFT (kidney function tests), five had deranged LFT (liver function tests), three had raised serum

amylase/lipase and eight patients had sickling test positive (there is high prevalence of sickle cell disease in Vidarbha region, where the study was conducted, because of higher incidence of consanguineous marriages in lower caste people). Abnormalities in these tests, the presence of red flag findings (rectal bleeding, weight loss, anorexia, significant vomiting or diarrhea etc.) or specific clinical findings mandate further testing, even if previous assessments have been negative.²³

All patients underwent USG of abdomen and pelvis with seventy-four positive findings out of hundred. Out of seventy-four, maximum cases were having hepatosplenomegaly, followed by the presence of kidney and ureteric stones, growth in upper GIT (cases of carcinoma stomach and peri-ampullary carcinoma), growth in lower GIT (cases of carcinoma colorectal region). Minimum cases were of Cholelithiasis. Few other gynecological disorders like uterine fibroid, pelvic inflammatory diseases, ovarian cysts were also found. CT scan was performed in twenty-four patients which provided twenty-two positive findings, out of which hepatobiliary and genito-urinary tract diseases were maximum with six cases each, four had carcinoma stomach, two were diagnosed as pancreatitis, two as colorectal malignancies, one para-aortic lymphadenopathy and one gastrointestinal stromal tumour. Two cases had no findings and were the cases in which CT scan was done on request (suggestive of functional gastro-intestinal disorders). Upper GI endoscopy was done in twenty-two patients with nineteen positive findings, biopsy was taken wherever required. Barium studies provided positive findings in two out of eight patients. One had features suggestive of carcinoma stomach and other had carcinoma caecum (Table 2).

Final diagnosis suggested that GIT diseases were the cause of CAP in maximum patients i.e. fifty-nine cases. Eleven cases out of those fifty-nine GIT diseases were found to be having functional gastrointestinal diseases (FGIDs) (Table 3). The diagnosis was based on Rome III diagnostic criteria, according to which five patients were found to be having irritable bowel syndrome, four patients fit into the category of functional abdominal pain (category D) and out of those four patients, three fulfilled the criteria for FAPS (category D1) while one patient was diagnosed as Unspecified functional abdominal pain (category D2) as the clinical findings fail to meet the FAPS criteria (criteria was fulfilled for the last 3 months but symptom onset was less than 6 months prior to diagnosis) (Table 4).²

Two patients were having functional dyspepsia.¹⁶ GUT (genitor-urinary tract) disease was found in thirty, hepatobiliary in eight and gynecological disorder in three cases (Graph 2) (Figure 2).

Functional abdominal pain (FAP) was found in four patients out of hundred in our study with three patients having Functional abdominal pain syndrome (FAPS)

(category D1) and one patient with unspecified functional abdominal pain (category D2).

Table 3: Classification of patients with gastro-intestinal disease after final diagnosis.

Gastro-intestinal disease	No. of cases
Oesophagitis	2
Oesophagitis with fundic ulcer	1
Carcinoma oesophagus	1
Gastritis	8
Alcoholic gastritis	3
Antral gastritis	4
Gastroenteritis	1
Gastric ulcer	2
Carcinoma stomach	3
Amoebiasis / worm infestation	5
Para aortic lymphadenopathy	1
Colitis	1
Sub-acute intestinal obstruction (TB abdomen)	1
Gastrointestinal stromal tumor	1
Carcinoma caecum	1
Carcinoma colon	1
Carcinoma rectum	1
Catarrhal appendicitis	2
Chronic recurrent appendicitis	7
Pancreatitis	2
Functional abdominal pain	4
Irritable bowel syndrome	5
Functional dyspepsia	2
Total	59

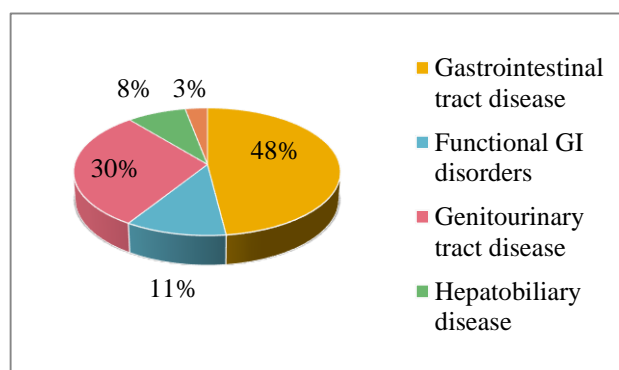


Figure 2: Distribution of patients after final diagnosis.

Two patients had history of adverse life events few years back. Another two patients had history of abdominal surgeries. The pain behavior in all four patients was notable. One patient reported associated pain in the lower limbs. A characteristic presence of closed eye sign was found in two out of four patients.

Table 4: Rome III diagnostic criteria for Functional abdominal pain syndrome.

Must include all of the following: (Criteria fulfilled for the last three months with symptom onset at least six months prior to diagnosis)
1. Continuous or nearly continuous abdominal pain
2. Poor relationship of pain with physiological events (e.g. eating, defecation or menses)
3. Some loss of daily functioning.
4. The pain is not feigned (e.g. malingering)
5. Insufficient symptoms to meet criteria for other functional gastro-intestinal disorders that would explain the pain.

In all the cases the pain reported was severe in intensity and involving a large abdominal area, but noted to be diminished when the patient was distracted. All of them were seeking medical advice since a longer period, unresponsive to their medical therapy and were having no positive findings despite all necessary investigations performed. Out of three patients with FAPS, one was adolescent male and other two were females in the age-group of >40 years

DISCUSSION

Chronic abdominal pain (CAP) is a prevalent condition, but often it is very difficult to find a cause owing to its broader differential diagnosis. Evaluation of chronic abdominal pain of luminal etiology is a challenging problem and the exact localization of lesion to either small or large bowel remains an elusive identity in many subjects. In tropical countries, where most of the population is of low socioeconomic status, one needs an imaging modality which screens small and large bowel lesions simultaneously at a reasonable cost with good sensitivity and specificity. In general, simple tests (including urinalysis, CBC, liver function tests, ESR, amylase, and lipase) should be performed. Abnormalities in these tests, the presence of red flag findings, or specific clinical findings mandate further testing, even if previous assessments have been negative.

USG of the abdomen and pelvis is usually performed first to exclude non-intestinal origin of the pain. Pelvic USG is indicated because of its sensitivity for free fluid, the frequency of retroperitoneal disease and the visualization of the ileum for Crohn's disease, adenopathy and chronic features of abscess from fistulas or Meckel's diverticulum.²⁴ In the present study twenty-one patients were diagnosed to be having urolithiasis on the basis of USG. Two patients had cholelithiasis. Twenty-six had no abnormal finding in the USG i.e.74% positivity rate. If USG reveals no abnormalities and either chronic peptic

disease or irritable bowel disease is suspected, gastrointestinal endoscopy is indicated.

Colonoscopy/Barium enema is indicated primarily in the context of chronic intussusceptions or obstruction and colorectal carcinoma.²⁵ Small bowel evaluation by Barium meal follow through (BMFT) and colonic evaluation by double contrast barium enema (DCBE) are the standard norms. In the present study eight patients underwent barium studies upper and lower GIT. Two had positive findings with one having carcinoma caecum, and other with carcinoma stomach ie.25% positivity rate.

Plain and CECT abdomen (Contrast Enhanced Computed Tomography) allows evaluation of intestinal and extra-intestinal mass lesions, abscesses and retroperitoneal diseases. It is especially helpful in diagnosing pancreatic, hepato-biliary, genitor urinary, gynecological diseases and staging malignancies. MRCP, ERCP, and laparoscopy are rarely helpful in the absence of specific indications.

Upper GI endoscopy is indicated once Gastro-Oesophageal Reflux Disease (GORD), Peptic Ulcer Disease or malignancies of upper GIT is suspected. Biopsies must be taken in diagnosing malignancies. Colonoscopy has replaced barium enema in the evaluation of pain with chronic diarrhea or bleeding.²⁵ In twenty-two patients upper GI endoscopy was done, out of which nineteen had some positive findings. As Gastroenterologist was not available in the hospital, hence colonoscopy could not be done, however upper GI endoscopy was done by trained surgeons.

Present study revealed eighty-nine out of hundred patients to be having some organic disorder causing CAP and eleven patients diagnosed as functional GI disorders. 59% of total cases had diseases related with the GIT, however there were thirty GUT cases, eight cases of hepatobiliary system and three cases of gynecological problems (Graph 2). The figures may vary geographically as few diseases are related with dietary patterns, living conditions, race and caste.

4% cases were diagnosed as having functional abdominal pain with three patients fulfilling the criteria for FAPS while one diagnosed as unspecified functional abdominal pain through Rome III diagnostic criteria.² (Table 4). It was the careful clinical history including characteristic description of pain events, positive history of adverse life events in some, history of surgeries and a characteristic pain behavior during physical examination which suggested the presence of this rare subgroup of FGIDs. In the present study, other behavioral traits that were observed in the patients with FAPS were the requests for invasive and expensive investigations not suggested by the examiner, and not considering the absence of any organic cause and presence of functional etiology contributing to their symptoms.

The reported prevalence for FAPS is 0.5-2% and is more common in females with 3:2 ratio.^{7,15,20} In the present study, 3% of FAPS cases were found, with a female preponderance. Diagnosis and correct identification of the cases with FAPS limits further investigations and helps in deciding the treatment plan for this condition. However, the patients should be followed up regularly and a rare possibility of diagnostic failure should be borne in mind, if the symptoms change.²⁶ As a follow-up study the available data can be utilized to evaluate the prognosis of this condition.

The treatment strategy for the patients with FAPS included an effective doctor-patient relationship to be established, involving empathy towards the patients, reassurance and in particular, patient education regarding the pathophysiology of the condition; and treatment negotiations. Patients were followed up after 2 months and specific measures including pharmacological intervention in the form of administering low dose tricyclic antidepressants (Amitriptyline 10 mg once daily) was planned in the non-responders.

A fundamental understanding of the pathophysiology of FAPS is essential for successful pharmacological intervention and management. The exact aetiology and pathogenesis of the pain are unknown. Yet, there is a growing body of evidence that the pain is the result of disordered brain-gut communication involving both the efferent and afferent pathways by which the enteric and central nervous systems communicate. The importance of bidirectional brain-gut axis has been increasingly recognized in functional gastro-intestinal illness. The brain receives a constant stream of interceptive input from the GI tract, integrates this information and sends the responses back to the GI tract. In health, majority of these inputs reaching the brain are not consciously perceived but serve as the inputs to autonomic reflex pathways. In patients with FAPS, conscious perception of these interceptive information can occur in the form of constant or recurrent discomfort or pain owing to the activity in the stress and arousal circuits and by cognitive and emotional inputs to these circuits. A model is proposed in patients with IBS and similar alterations in brain-gut interactions are extrapolated to patients with FAPS.²⁷

The neurophysiological dysfunctions that are suggested to result in chronic deleterious pain in this condition may arise at any level of the visceral neuraxis. This dysfunction may be due to peripheral augmentation of the visceral pain afferent signal, central sensitization around the spinal dorsal horn, alterations in descending modulation or central amplification.

Peripheral augmentation of visceral afferent signaling may occur after repeated injury or inflammation. A recent important case control study demonstrated that 15.3% of patients undergoing gynecological surgery, for non-pain-related conditions, developed abdominal pain at twelve

months compared with 3.6% of healthy controls who did not undergo surgery.²⁸ Another study demonstrated that rectal perceptual thresholds were significantly reduced in IBS, but interestingly, not in FAP, suggesting that pain reporting in FAP is less likely to be attributable to visceral hypersensitivity.²⁹

Central sensitization due to increased responsiveness of the dorsal horn neurons has been suggested as a pathophysiology for FAPS.³⁰ Repetitive experimental stimulation or gut injury also have been reported in various studies to induce hyperalgesia owing to both peripheral augmentation as well as central sensitization in the GI tract after gut injury.³¹

Disturbances in central descending modulation of pain have been proposed to account for the pronociceptive state in the FAP. The central descending modulatory systems, largely residing in the ACC, that control visceral pain connect with the spinal dorsal horn, facilitating gating of afferent signals from the periphery and hence allowing amplification or diminution of this signal. There is increasing evidence in FGIDs that cognitive, emotional, autonomic, and spinal reflex pathways influence supraspinal and spinal pain modulation.³²

Stressful events are known to be contributory factors in FAPS. One of proposed mechanisms in which stress, both early and later in life could modulate symptoms in functional pain syndromes is through the Corticotrophin releasing factor (CRF), one of the important hormones involved in the stress response. Studies have shown that stress early in life results in both acute and chronic changes in the activity and regulation of the hypothalamo-pituitary-adrenal (HPA) axis, particularly in the form of hypersecretion of CRF.³³ CRF can induce an increase in colonic motility and in IBS this motility effect is markedly increased compared to normal individuals.³⁴ The exact neural and hormonal pathways that increased excess gut sensitivity and altered contractility during stress are not defined. Psychological stress can lead to permanent alterations in the HPA axis, the descending pain modulatory system, the immune system and the gut microbiota. Mechanisms by which physical stress such as infections mediate visceral hypersensitivity are likely to be different and may involve altered immune system functioning.³⁵

CONCLUSION

To conclude, chronic abdominal pain is a multifactorial condition. For the evaluation of CAP, patients must undergo routine haematological investigations, urine analysis and stool examination based on signs and symptoms. USG must be done in all the cases as a first line investigation. It is non-invasive, cheap, and easily available and can diagnose many conditions causing CAP. It has the advantage of good patient compliance. CT scan is very sensitive but a costly investigation and should be done in the patients having findings suggesting

a disease on USG and other investigations. CT scan, Endoscopy and other invasive investigations should be reserved as the second line investigations. These investigations must be guided by the reports of the primary investigations and clinical findings. Thorough history coupled with a complete physical examination and investigative profile help to a great extent in diagnosing the cause of CAP. Clinical evaluation of FAPS should include a detailed history including a comprehensive account of psychosocial problems and only targeted investigations should be undertaken. A correct identification of this subgroup should be a priority for the clinicians which will guide a successful outcome in the management of this uncommon condition with a comparatively higher socio-economic impact. Treatment strategy should include an effective doctor-patient relationship involving patient education regarding the pathophysiology of FAPS and a variable combination of pharmacological interventions, cognitive behavioral therapy and psychotherapy is often necessitated.

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