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Original Research Article

Epidemiological Profiling of Pain Abdomen Cases Presenting to a Rural Hospital of South Rajasthan

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ABSTRACT

Introduction: Pain Abdomen is one of the most common complaints of patients coming to a hospital. Pain Abdomen is caused by a wide variety of disorders ranging from organic to functional. Epidemiological profiling of various causes of Pain Abdomen in a region can not only reduce the preventable causes of it & improve quality of life of population, but also can greatly reduce the economic burden upon the society.

Materials & Methods: We studied all the patients above 12 years of age, presenting to J. Watumull Global Hospital & Research Centre (GHRC), Mount Abu, Rajasthan, with the complaint of Pain Abdomen; during a period of 18 months from September 2015 to March 2017. GHRC being an important primary and secondary care hospital of the region with a wide rural penetration through its village out-reach and community health projects, the study population was supposed to be largely a sample population of South West Rajasthan. Thorough physical examination and basic investigations (CBC, urine examination, stool examination and abdomen ultrasound) were done to find out the cause of Pain Abdomen. Other specific investigations were done as and when required to reach a definitive diagnosis. Rome III diagnostic criteria based questionnaire was used to find out Functional G I disorders.

The data collected were analysed to find a trend and a possibility to use the data to institute effective preventive measures.

Results: Total 760 patients were registered.

In our study population, slight female predominance (52.9%) was observed.

As expected, system wise, Gastro Intestinal disorders topped the list (49.5%) followed by Urinary system (34.3%), Gynaecological system (16%) and Functional Disiorders (13.3%) with several overlap, but classifying according to various groups of disorders, the commonest cause of Pain Abdomen was found to be urolithiasis (27%), followed by infective/infestatational intestinal disorders (22.4%) , Gynaecological disorders (Pelvic Inflammatory Disease, Dysmenorrhoea etc) (16%), Acid Peptic (including Gastro Esophageal Reflux) Disease in (14.2%), functional G I disorders in (13.3%) and gall bladder and liver diseases in (12.9%).

Among investigations, USG abdomen was found to be the most useful diagnostic modality with highest contribution (79.3%) in providing a definitive diagnosis. Rome III diagnostic criteria was useful to diagnose functional G I disorders. Majority (63.6%) patients reported consumption of Government supplied water.

Conclusion: Urolithiasis and Inflammatory/Infective Gut Disorders, in that order, are the two most common causes of Pain Abdomen in South West Rajasthan. Functional G.I. Disorders contribute to a lesser extent compared to the global and Indian prevalence rate. Clean and safe drinking water and life style modification can possibly reduce the prevalence to a great extent.

Keywords: abdominal pain, epidemiology of Pain Abdomen, South Rajasthan, urolithiasis, functional G.I. disorders

INTRODUCTION

Pain Abdomen is one of the most common complaints of patients coming to a hospital. The prevalence rate of Pain Abdomen has been found to be 22 to 28% in various studies. [(1)] Chronic Pain Abdomen is a commonly seen complaint by primary care physicians, gastroenterologists, and pain physicians. Generally, it is defined as continuous or intermittent abdominal discomfort for at least 6 months. [(3)] Pain Abdomen is a symptom caused by a wide variety of disorders ranging from organic to functional. The organic causes of pain abdomen may be inflammation ulceration, perforation, haemorrhage, malignancies, obstructions or distension of intra abdominal organs including the retroperitoneal structures. However, some acute medical problems like porphyria, diabetic ketoacidosis and several heart and lungs may also present with Pain Abdomen. [(2)] Pain Abdomen is also the most common feature of functional gastrointestinal disorders such as irritable bowel syndrome and functional dyspepsia. Functional Pain Abdomen is a more challenging problem and can be difficult to diagnose and manage. In patients with functional abdominal pain, frequently, there is no clear organic cause that can explain the underlying symptoms. [(3)]

There are also a few studies which suggest a correlation between Pain Abdomen & psychological disorders like anxiety and depression. [(4)] The approach to the diagnosis of Pain Abdomen needs careful history taking and a thorough evaluation of symptoms, head to toe physical examination and judicious use of laboratory investigations which can simplify the evaluation of the involved disease entity. Pain Abdomen, despite its frequent occurrence, is sometimes difficult to manage because no matter how thorough the work up is, specific diagnosis is not possible in as many as 30% cases. [(5)]

A number of causes of Pain Abdomen may be preventable. The preventable causes of Pain Abdomen, include causes related to communicable/infectious diseases; causes related to life style diseases and causes related to environmental factors like water pollution. Majority of the districts of South Rajasthan are conventionally described as "High Fluoride" areas of Rajasthan. [(6)] Fluorosis is also one of the well known environment related cause of chronic Pain Abdomen mainly by causing non ulcer dyspepsia [(7)] and urolithiasis. [(8)]

So far, there has been no study in Rajasthan, India, especially the South West part of Rajasthan to find out the prevalence of various causes of Pain Abdomen. Through this study, we attempted to pick up the various causes, including the most preventable causes of Pain Abdomen in this region. Our observations may help the authorities to formulate actions to eliminate these causes so that the quality of life in this region improves, and economic burden on the healthcare system and on the population itself reduces.

MATERIALS ND METHODS

This was a prospective, observational, cross sectional study conducted at a 102 bedded rural hospital (J. Watumull Global Hospital & Research Centre, popularly known as GHRC) at Mount Abu, Rajasthan, India. All patients of above 12 years of age with complaint of abdominal pain; were included in the study. Patients with Pain Abdomen due to labour and trauma were excluded from the study.

Total 760 patients who visited medical, gynecology, surgical Out Patient and Emergency Department were registered in fulfillment of inclusion criteria and who participated in study with in research duration period of 18 months (September 2015 to March 2017) were taken according to purposive sampling method.

Patients were subjected to standard uniform protocol: history taking with uniform questionnaire, physical examination with uniform checklist, ultrasonography of whole abdomen by one sonologist and laboratory investigations with complete blood count, urine routine and microscopic examination, and stool routine examination. By the end of this protocol, we were able to pick the cause or at least the organ/system involved for Pain Abdomen.

Beyond this point, specific investigations to reach a definitive cause of organic Pain Abdomen were done on individual basis depending upon the indications. Specific investigations included plain and contrast Radiography, CT Scan, GI Endoscopy and specific biochemical tests as and where indicated. Patients without any organic cause of Pain Abdomen were screened with questionnaire of Rome III criteria to rule out functional gastro intestinal disorders. Collectively on the basis of the interpretation of examination findings and investigation results, we had reached a definite diagnosis & cause of Pain Abdomen in patients.

The data analysis was done using SPSS version 20 (IBM SPSS Statistics Inc., Chicago, Illinois, USA) Windows software program. The study was approved by the Ethical Committee of J.W Global Hospital & Research Centre. Informed consent from all the participants was taken.

RESULTS

More than half of the patients with Pain Abdomen were between the age of 21-40 years (53.2%)**.** Result showed female predominance with 52.9 % female patients and male patients were 47.1%. Majority of patients (61.3%) had Pain Abdomen onset within the preceding 6 months whereas 38.7% patients had chronic Pain Abdomen i.e. a duration of more than 6 months.13.3% patients fulfilled the criteria for Functional Pain Abdomen. In these patients, bothersome post-prandial fullness was the commonest functional symptoms in patients (27.5%) followed by early satiation (24.7%), constipation (22.9%) and epigastric burning (22.8%) and bloating (17.1%).

Abdominal ultrasonography was the most contributing diagnostic modality with 79.3% positive results. Urine examination was the second most useful investigation to with 33% positive results. Contribution of stool examination was 21.1%, complete blood count 18.4% and upper G I endoscopy 17.9%.

Amongst the various causes of Pain Abdomen, urolithiasis was found to be the most prevalent (27%) followed by Infective/Infestative Intestinal Diseases with 22.4% prevalence. The latter included 7.8% cases of Protozoal Gut Infestation. The other causes of Pain Abdomen included gynecological disease (16.1%) where pain associated with dysmenorrhoea was more frequent (7.6%). Prevalence of PUD /GERD group diseases was 14.2 % where GERD was the commonest problem found in 10.3% patients, and Urinary Tract Infections in 11.8% patients. In our study we found that the prevalence of functional G I disorders is 13.3 %, amongst which, functional dyspepsia was the commonest diagnosis (8.8%) followed by IBS (3 %), FAPS (0.9%) and functional gallbladder & sphincter oddi disorder (0.5%). Prevalence of pain associated with gall bladder and liver diseases was 12.9 % amongst which, cholelithiasis was the commonest cause of (7.5%) followed by hepatitis (4.1 %). The prevalence of diseases associated with pancreas, intestinal obstruction and others was 5.1%. An interesting observation of our study was that the majority of patients (63.6%) consumed drinking water from government supply. Out of the rest, 9.2% patients obtained their drinking water from

hand pump, 8.4 % from borewell and 1.6% from open village well. 17.8% patients used reverse osmosis system for water purification, and were counted as a separate group irrespective of their water source.

Table No. 1: Age wise distribution of patients

Age (years)	No. of patients	Percentage (%)
12-20	35	4.6
21-40	404	53.2
41-60	262	34.5
> 60	59	7.8
Total	760	100.0
Mean ± SD	39.14 ± 12.83	

Table No. 2: Gender wise distribution of patients with abdominal pain

Gender	No. of patients	Percentage (%)
Female	402	52.9
Male	358	47.1
Total	760	100.0

Table No.3: Contribution of various investigations and diagnostics

Investigations	Contributed		Not contributed	
	No. of patients	%	No. of patients	%
CBC	140	18.4	620	81.6
Stool examination	160	21.1	600	78.9
USG Abdomen	603	79.3	157	20.7
UGI endoscopy	136	17.9	624	82.1
Urine examination	251	33	509	67

Table No. 4: Prevalence of disease groups leading to abdominal pain

Disease group	No. of patients	Percentage
PUD / GERD	108	14.2
Pain associated with gall bladder and liver	98	12.9
Infective intestinal disease	170	22.4
Gynecological disease	122	16.1
Functional GI disorder	101	13.3
Urological disease	261	34.3

Table No. 5 : Prevalence of urological diseases

Disease	Present		Absent	
	No. of patients	%	No. of patients	%
Urolithiasis	205	27	555	73
Infective urological disease	90	11.8	670	88.2

Table No. 6 Water source and urological disease

	Urological disease				Total	
Drinking water source	No Disease	Urolithiasis	Infective Urological Diseases	Both (Urolithiasis + Infective) Urological Diseases		p value
Govt. supply	297	124	40	22	483	0.005 (S)
Village well	9	2	1	0	12	0.82
Bore well	50	4	4	6	64	0.004 (S)
Hand pump	39	20	5	6	70	0.15
Reverse osmosis	110	20	4	1	135	0.001 (S)
Total	501	170	54	35	760	

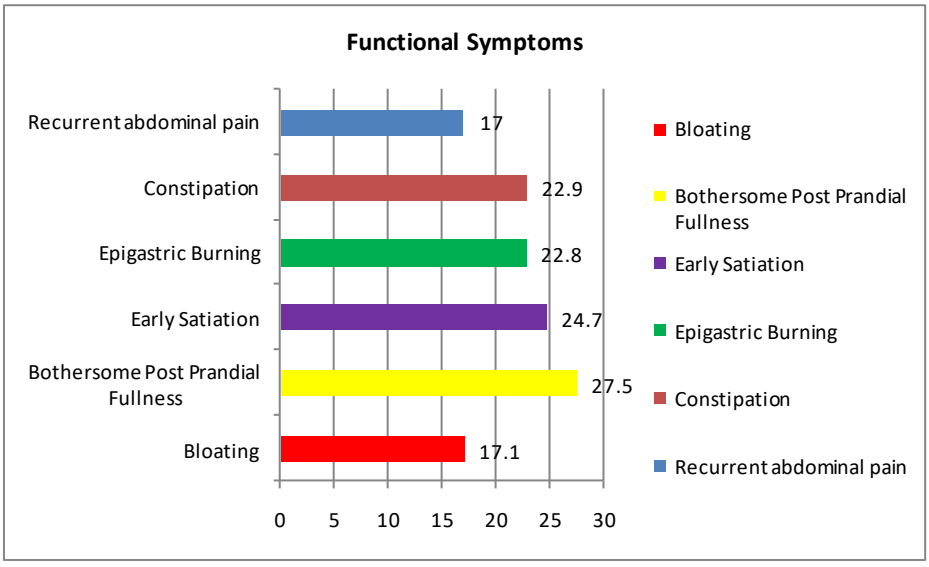

Figure No.1: Distribution of associated Functional Symptoms in patients with abdominal pain

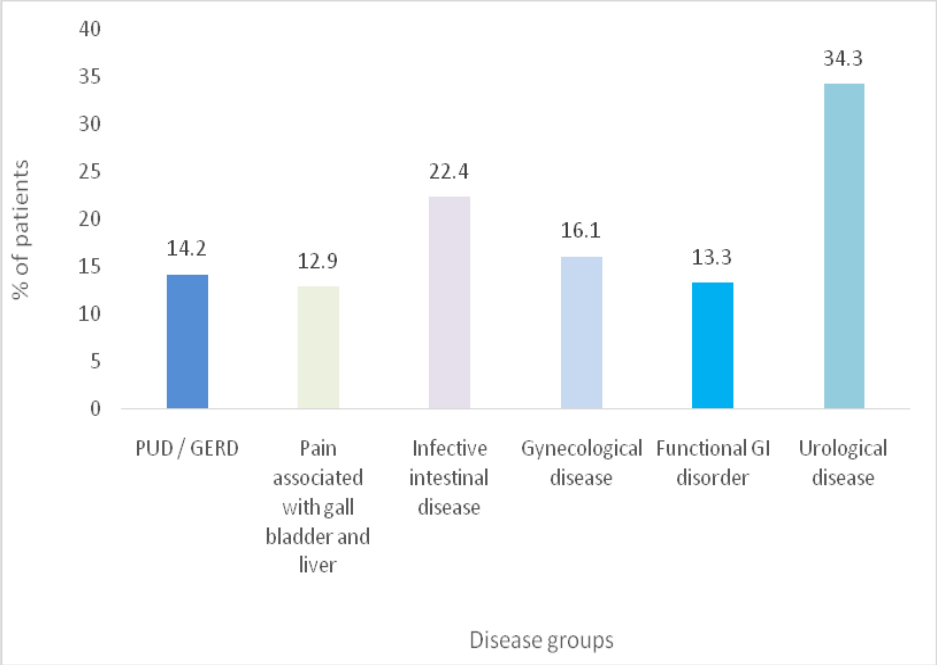

Figure No. 2: Prevalence of disease groups leading to abdominal pain

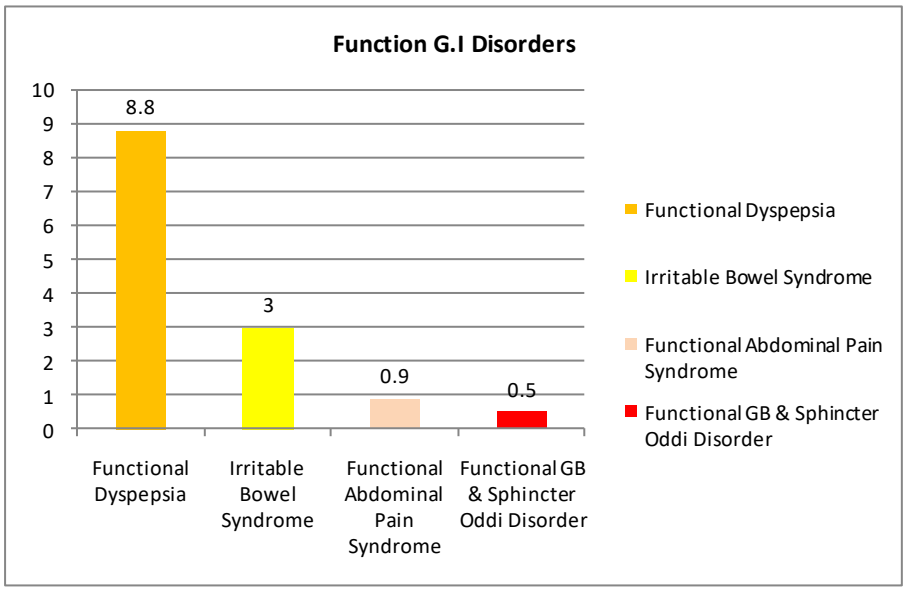

Figure No. 3: Prevalence of Functional G I Disorders

DISCUSSION

The aim of this study was to find out the common causes of Pain Abdomen in the region of South West Rajasthan with a view to help healthcare professionals and government authorities in formulating preventive and treatment strategies.

Chronic pain abdomen is believed to be a malady of working class; various studies [(9,10)] reporting the majority of the affected population belonging to the 15-40 yrs age group. In our study also, more than half the affected population [53.2%] belonged to the 21-40yr age group Different geographical regions also record different common causes of pain abdomen. For example, urolithiasis in a very common disease in north India as compared to the south and eastern India. [(11)] Similarly, areas where groundwater is rich in fluorides have higher incidence of urolithiasis. [(8)] The high prevalence (27%) of urolithiasis as a cause of pain abdomen in our study, therefore, is not surprising as the ground water in

Southwest Rajasthan is known to be rich in fluoride. [(6)] In our study, amongst 27% of urolithiasis patients, 72.94% had consumed drinking water from government supply. This suggests high relation of urolithiasis with govt. supplied drinking water which is likely to be untreated or poorly treated to eliminate fluoride contents.

G.I disorders are the other major prevalent cause of pain abdomen all over the world. In the United States alone, according to a study done in 2015, more than 27 million patients of Gastrointestinal disorders presented with Pain Abdomen, while another one million patients presented with Heartburn and Indigestion in the year. [(12)] According to a survey by CDC in 2016, in the US, 32.3 million people visited the physician office for digestive disorders, 8.6 million of which were emergency visits. [(13)] The economic burden of the digestive diseases alone in the United States was estimated to be about 142 billion in 2004. [(14)] The attributable causes of these gastrointestinal disorders are diverse, and include drinking water quality, Food hygiene, Food Habits, Genetics, and also the psychic /emotional disposition. Obviously, many of these causes are influenced by the geographic location, economy and social habits. In our study, as a group, G.I and hepatobiliary causes made up to 49.5 % of all cases of pain abdomen. This included 22.4 % of cases with Infective and Infestational Intestinal disorders, 14.2% cases of Acid Peptic Disease, and 12.9 % cases of liver and Gall Bladder related issues. Our Study area of South West Rajasthan is economically the poorest region of Rajasthan with 39% of state's tribal population living in this region. [(15)] This region is also labelled as the High Fluoride belt. [(6)]

Apart from the organic G.I Disorders, functional symptoms like postprandial fullness, bloating, constipation, epigastric burning pain, recurrent Pain Abdomen without any organic pathology is mainly found in patients with chronic Pain Abdomen; especially functional G.I disorders like functional dyspepsia and irritable bowel syndrome. Prevalence of functional dyspepsia is about 20-30% worldwide. [(16)] A study from India reported prevalence of dyspepsia to be 30.4%. Before undertaking Upper G. I. Endoscopy, patients are categorized as un-investigated dyspepsia (UD). If there is no organic cause to explain dyspeptic symptoms on upper gastrointestinal endoscopy, the patient is diagnosed having functional dyspepsia (FD). [(17)] Majority of dyspeptic patients have FD as organic causes are quite uncommon. [(18)] It has been shown that gastric H. pylori infection is associated with dyspeptic symptoms. But cause and effect relationship has not yet been established beyond doubt. Seroprevalence of H. pylori is high in developing countries such as India. 80% of Indian adults have antibodies against H.pylori in their sera. [(19)] Recently, gastrointestinal infection has been recognized as a possible etiological factor in the pathogenesis of FD. [(17)] This subset of FD that develops after an episode of gastrointestinal infection is termed as post-infectious FD. This may suggest that an inflammation-immunological circuit may also play important role in the development of FD. [(20)] Due to the diversity of dietary habits within individual populations the role of diet in dyspepsia has not been established. Study from Mumbai India have shown that vegetarians or non vegetarian diet have no effect on dyspeptic symptoms, and spicy, fried or food prepared outside the home contributed insignificantly to worsening of symptoms. [(21)] A bio-psycho-social model to explain FD has been proposed, whereby biological, psychological and social factors interact to account for the patient's symptoms, behavioural response and disease outcome. FD can then be seen as a result of dysregulation of intestinal motor, sensory and CNS activity, resulting from interruptions at some level of the brain gut axis. The most common psychiatric co-morbidities in patients with functional dyspepsia are anxiety disorders, depressive

disorders, somatoform disorders, and a recent or remote history of physical or sexual abuse. [(22)] In the majority of population-based studies, prevalence of dyspepsia has not been found to be linked with social class.

In our study, a total of 13.3 % patients were labelled as those with Functional G.I Disorders based on the ROME III criteria. This was slightly less than expected, and may indicate a relatively less stressed lifestyle of the tribal population. This study, however, had its own limitations, and further research is required to make a statement. Selection of proper investigations and diagnostic methods on the basis of complaints, physical examination and signs play a vital in establishing a definitive diagnosis of. In our observation of Ultrasonography had the highest contribution in helping to make a definitive diagnosis; with 79.3% positive results. Urine examination was the second most useful investigation with 33% positive results. This study adds support to the findings of previous studies which had concluded that ultrasound has a relatively high sensitivity, specificity and diagnostic accuracy in non traumatic acute abdomen cases. [(23,24)]

Rajasthan is the largest state of India (342,239 km^2 wide) with total population of 6,85,48,437 & relatively low population density of 200 people/km^2. According to physical geography, the southern parts of the state are classified under the Peninsular Plateau. Aravalli mountain ranges break up districts of South Rajasthan. Udaipur, Chittorgarh, Dungarpur, Banswara, Rajsamand and Sirohi are districts of south zone of Rajasthan. As mentioned earlier, this is economically the poorest region of Rajasthan with 39% of state's tribal population. [(15)] These are also the districts which are conventionally described as "High Fluoride" areas of Rajasthan. [(6)] Fluorosis is also one of the well known environment related cause of metabolic changes represented by, amongst other features, pain abdomen. Researchers have found that drinking fluoride-contaminated water can cause chronic abdominal pain & non-ulcer dyspepsia and Urolithiasis in the affected population. They suggest that switching to safe potable water with low fluoride levels can help prevent such abdominal pain. [(7)] To this, we can add that not only fluoride treatment, but also prevention of soil and faecal contamination of the drinking water is essential in prevention of Pain Abdomen cases in this region.

The limitation of this study is that it was confined to one healthcare centre, which, although catered to a large geographical area of the region by virtue of its charitable nature, and its various community and village outreach programmes, the sample size cannot absolutely be considered as true representative of the region. A multicentric study can capture a more accurate set of data.

CONCLUSION

Urolithiasis and G.I Inflammation are the two most common causes of Pain Abdomen in South West Rajasthan. Gut Protozoonosis also contribute significantly as causes of Pain Abdomen. The contribution of Functional G.I Disorders is slightly less than the Global and Indian average. Lack of clean and safe drinking water seems to contribute. Life style modification and providence of clean and safe drinking water can substantially reduce the incidence of pain abdomen in this region.

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REFERENCES

1. Maria Adele Giamberardino. Visceral Pain- Clinical Pathophysiological And Therapeutic Aspects, 1st edition ed. NewYork: Oxford University Press; 2009.

2. Paterson-Brown. S. Bailey & Love's Short Practice of Surgery, 25th ed. London: Hodder Arnold; 2008.
3. Reda Tolba, Joshua Shroll, Abdul Kanu, Maged K. Rizk. Abdominal Pain: An Evidence-Based, Comprehensive Guide to Clinical Management. New York: Springer Science+Business Media; 2015. http://www.springer.com (accessed 04 February,2016).
4. Walter S.A, Jones MP, Talley N.J et al.. Abdominal pain is associated with anxiety and depression scores in a sample of the general adult population with no signs of organic gastrointestinal disease. Neurogastroenterology and Motility 2013; 25(9): 741-e576.
5. Powers RD, Guertler AT. Abdominal pain in ED: stability and change over 20 years. American Journal of Emergency Medicine1995; 13(3): 301-303.
6. Hussain J., Sharma K. C, Hussain I. Fluoride In drinking water in Rajasthan and its ill effects on human health. Journal of Tissue Research 2004; 4(2): 263 -273.
7. Chahal Ashok, Bala Manju, Dahiya R.S.,Ghalaut Veena Singh. Comparative evaluation of serum fluoride levels in patients with and without chronic abdominal pain. Clinica Chimica Acta; International Journal of Clinical Chemistry 2014; 429: 140-142.
8. Rathee N, Garg P, Pundir C.S. Correlative study of Fluoride content in serum and urinary calculi. Indian Journal of Clinical Biochemistry 2004; 19(2): 100-102.
9. Chanana Lakshay, Jegaraj Moses A.K,Kalyanwala Kimmin, Yadav Bijesh et.al. Clinical profile of non-trauamtic acute abdominal pain presenting to an adult Emergency Department. Journal of Family Medicine and Primary Care; 4(3): 422- 425.
10. Richard J. Brewer, Gerald T. Golden, David C. Hitch, Leslie E. Rudolf et al. Abdominal pain - an analysis of 1,000 consecutive cases in a university hospital Emergency Room. The American Journal of Surgery 1976; 131(2): 219-223.
11. Ganesamoni Raguram, Singh Shrawan K. Epidemiology of Stone Disease in Northern India. https://doi.org/10.1007/978-1-4471-4387-1_4 (accessed 10 January, 2017).
12. Peery A.F, Crockett S.D, Barritt A.S, Dellon E.S et.al. Burden of Gastrointestinal, Liver, and Pancreatic diseases in the United States. Gastroenterology 2015; 149(7): 1731-1741.
13. National Centre for Health Statistics. Digestive Diseases. https://www.cdc.gov/nchs/fastats/digestive-diseases.htm (accessed 25 February, 2017).
14. National Institutes of Health, U.S. Department of Health and Human Services. Digestive Diseases Statistics for the United States. https://www.niddk.nih.gov/health-information/health-statistics/digestive-diseases (accessed 24 February,2018).
15. Directorate of Census Operations Rajasthan. Population, Size and Decadal Change; Scheduled Castes and Scheduled Tribes population. http://www.rajcensus.gov.in (accessed 06 August 2015).
16. Grainger S.L, Klass H.J, Rake M.O, Williams J.G. Prevalence of dyspepsia: the epidemiology of overlapping symptoms. Postgraduate Medical Journal 1994; 70: 154 - 161.
17. Shaib Y, El-Serag H.B. The prevalence and risk factors of functional dyspepsia in a multiethnic population in the United States. The American Journal of Gastroenterology 2004; 99(11): 2210-2216.
18. Ghoshal U.C, Singh R, Chang F.Y, Hou X et.al. Epidemiology of Uninvestigated and Functional Dyspepsia in Asia: Facts and Fiction. Journal of Neurogastroenterology and Motility 2011; 17(3): 235-244.
19. Ghoshal Uday.C, Chaturvedi Rupesh, Correa P. The enigma of Helicobacter

pylori infection and gastric cancer. Indian Journal of Gastroenterology 2010; 29(3): 95-100.
20. Suzuki Hidekazu. Post-infectious Functional Dyspepsia - A Novel Disease Entity among Functional Gastrointestinal Disorders - Relation to Helicobacter pylori Infection?. Journal of Neurogastroenterology and Motility 2010; 16(1): 97-98.
21. Shah S.S, Bhatia S.J, Mistry F.P. Epidemiology of dyspepsia in the general population in Mumbai. Indian Journal of Gastroenterology 2001; 20(3): 103 - 106.
22. Talley N.J, Fett S.L, Zinsmeister A.R, Melton L.J 3rd. Gastrointestinal tract symptoms and self-reported abuse: a population-based study. Gastroenterology 1994; 107: 1040 - 1049.
23. Aahaolu B.A, Aseleye M.C , Adetiloye A.V, Alatise I.O. Spectrum of Diseases and Diagnostic Values of Ultrasound in Adult Patients with Nontraumatic Acute Abdomen in a Nigerian Tertiary Health Facility. Nigerian Journal of Surgery 2015; 21(1): 6 - 12.
24. Sharma P, Sidharth, Singh BP,Singh D, Gupta A. Comparative study between plain Radiography and Ultrasound abdomen in non traumatic surgical acute abdominal conditions. Nepalese Journal Of Radiology 2012; 2(3): 20-27.

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