

# Pattern of Pediatric Gastrointestinal Disease at Referral Hospitals in Makah City (2015-2017)

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## Abstract

**Background:** Retrospective studies are important for reassessment of patient flow paradigm, efficacy of preventive methods and re-planning of medical service in health care providing institutes.

**Aim:** Determination of epidemiology of gastrointestinal diseases (G.I) among children and methods of prevention.

**Patients and Methods:** Retrospective study including 333 pediatric G.I patients seen at an (OPD and admission patients) done at a referral hospitals at Makkah city (2015- 2017). The medical record containing diagnosis of G.I disease which was done using full history taking and meticulous clinical examination in aid with adjuvant diagnostic means like x-rays, CT, MRI or endoscopy.

**Results:** Our records collect 333 patients complained from GI disease through the targeted time. Out of 333 patients, 302 (90.6%) patients were Saudi while 31 (9.3%) were of non-Saudi descent. Chronic constipation was the most prevalent GI disease (76) patients followed by inflammatory bowel diseases and irritable bowel syndrome (29) patients each. There was no bias in male-to-female selection and ratio was mirroring population data. Those below three the ratios were less than 10% of cases and most cases complaining of congenital diseases.

**Conclusion:** Care of the pediatric gastrointestinal disease at the city of Makah. It will alert the directory of the ministry of health to launch an appropriate health education for the people of Makah regarding the prevention of common problems like constipation which consume good proportion of the pediatric G.I clinic time. To educate the general pediatrician how to deal with simple common G.I disease (i.e. chronic constipation), how to treat it and the referral to G.I is only for the resistant cases.

## Introduction

A great change in pattern of gastrointestinal diseases in pediatric population has been observed at the last decade world widely [1,2]. Certain symptoms such diarrhea [3] declined in prevalence and others food allergies [3], constipation[4] and abdominal pain still stand in the rank [5-7]. Our study aim was designed to determine what happen in our daily records of GI practice in one of important governorates in the kingdom. Our aim was beyond knowing descriptive epidemiological patterns, but to raise the power of acting prospectively to counteract diseases and prevent complications.

## Patients and Methods

A retrospective and descriptive study including pediatric G.I patients seen at an (outpatient and inward admission patients) was done at a referral hospitals at Makkah city (2015 to 2017). There were 379 patients' files gathered, 46 files were excluded due to incomplete data necessary for information collection. At end of survey, 333 patients file were taken. The medical record containing diagnosis of GI disease which was done using full history taking and meticulous clinical examination in aid with adjuvant diagnostic means like x-rays, CT, MRI or endoscopy.

Variables such age, sex, residency and complaints were recorded in an excel sheet.

Our data analysis included descriptive statistical methods by using SPSS version.

## Results

Our study participants were divided according to route of admission for pediatric GI patients. It is clearly noticed that OP clinic faced more cases than ER department (Table 1). Of 333 patients, 302 (90.6%) patients were Saudi while 31 (9.3%) were of non-Saudi descent.

| years             | 2015   | 2016   | 2017   |
|-------------------|--------|--------|--------|
| ER admission      | 5,401  | 6,002  | 6,776  |
| No. of OPD visits | 35,839 | 38,649 | 37,315 |
| Total             | 41,240 | 44,651 | 44,091 |

Table 1: Number of admissions per year in OP and ER admission.

ER: Emergency room  
OPD: outpatient

Male distribution was 55.56% while female patients were 44.44%. There was no statistically significant differences between male and female distribution ( $p>0.05$ ).

Our results of chronic constipation demonstrated the most prevalent symptom in 76 patients (22.8%). Followed by abdominal

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pain and gastroesophageal disease (GERD). Corrosive ingestion and hepatitis were the less prevalent disorders (Figure 2).

Those who were below or equal to 1 month constituted 1.8% (6 patients) only. There was statistically significant difference between these two age groups ( $p=0.001$ ) (Table 2). In table 3, diseases distribution was reclassified according to above or below 1 month age.

The study participants were again divided into those who were above three months and those who were equal or below three months. Below three months group constituted 9.01% of the study group as shown in Figure 3.

In Figure 4, diseases frequency was reclassified according to 3 months age. Congenital diarrhea, cholestasis and foreign bodies were the most prevalent GI diseases.

Male to female distribution was plotted against diagnosis as in Table 4. Prevalence of diseases in relation to gender was found to be homogenously distributed as  $p$  value was 0.6 by using chi square t-test.

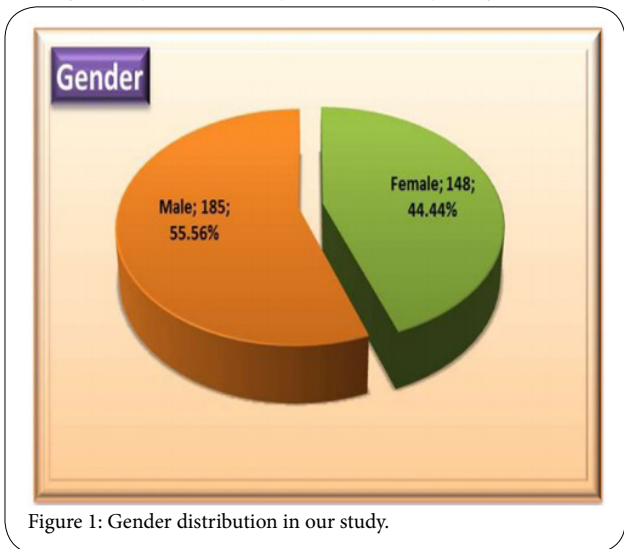


Figure 1: Gender distribution in our study.

| Age             | N                | %      |
|-----------------|------------------|--------|
| ≤1month         | 6                | 1.80   |
| <1month         | 327              | 98.20  |
| Total           | 333              | 100.00 |
| $X^2(P. value)$ | 223.811(<0.001*) |        |

Table2: Division of whole study participants into above and below one month. \*P value is regarded significant if below 0.05

Disease diagnosis were plotted against age group ranges as in Figure and Table 5.

Out of 23 patients with diagnosis of inflammatory bowel diseases, risk factors were identified in table 6. They were strongly adherent to inflammatory bowel diseases with statistically significant difference ( $p<0.0001$ ).

### Discussion

The data suggest majority of our admissions were single complaints, with higher male than female prevalence and increased frequency of chronic constipation (around 22%) [8,9]. The male-to-female differences were respecting the gender difference in our community and showed no bias in parental health seekers toward their children.

Most of admissions data came from outpatient clinic at either year [3].

Our study found no decline in infectious diseases and persistent increment of abdominal pain, GERD and constipation [1,9]. Findings are not beyond international findings in pediatric hospitals [2,3]. It is important to start a complementary study to assess patients' admission stay, costs and necessity to revise our protocols in pediatric inpatient treatment [8].

Efficiency of services are defined as the resources needed to obtain a given levels of benefit from that service [6]. The efficiency point is

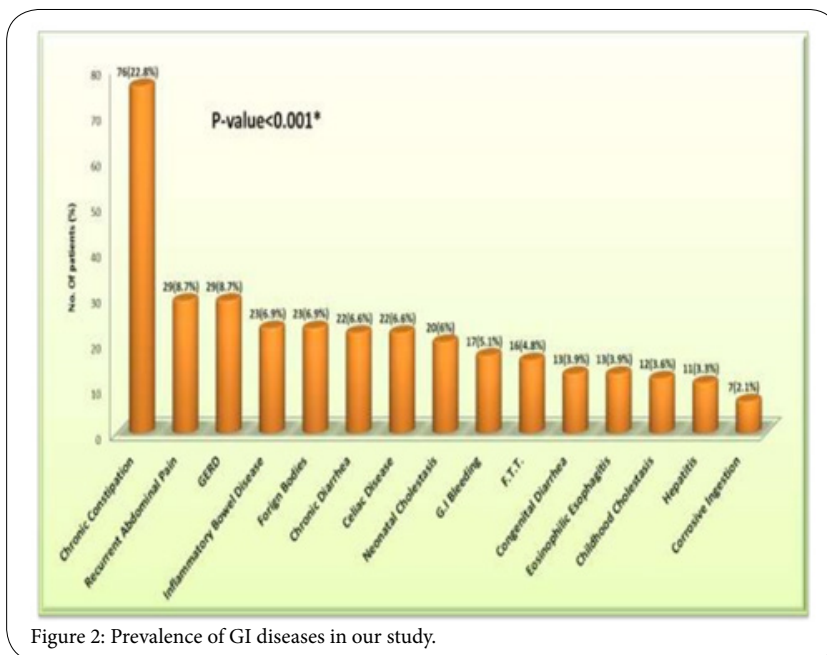


Figure 2: Prevalence of GI diseases in our study.

| Diagnosis                  | Age            |        |             |        | Total |        |  |
|----------------------------|----------------|--------|-------------|--------|-------|--------|--|
|                            | ≤ one month    |        | > one month |        | N     | %      |  |
|                            | N              | %      | N           | %      |       |        |  |
| Chronic Constipation       | 0              | 0.0%   | 76          | 100.0% | 76    | 100.0% |  |
| Neonatal Cholestasis       | 4              | 20.0%  | 16          | 80.0%  | 20    | 100.0% |  |
| Childhood Cholestasis      | 0              | 0.0%   | 12          | 100.0% | 12    | 100.0% |  |
| Recurrent Abdominal Pain   | 0              | 0.0%   | 29          | 100.0% | 29    | 100.0% |  |
| Chronic Diarrhea           | 0              | 0.0%   | 22          | 100.0% | 22    | 100.0% |  |
| F.T.T.                     | 0              | 0.0%   | 16          | 100.0% | 16    | 100.0% |  |
| G.I Bleeding               | 0              | 0.0%   | 17          | 100.0% | 17    | 100.0% |  |
| GERD                       | 0              | 0.0%   | 29          | 100.0% | 29    | 100.0% |  |
| Hepatitis                  | 0              | 0.0%   | 11          | 100.0% | 11    | 100.0% |  |
| Congenital Diarrhea        | 2              | 15.4%  | 11          | 84.6%  | 13    | 100.0% |  |
| Eosinophilic Esophagitis   | 0              | 0.0%   | 13          | 100.0% | 13    | 100.0% |  |
| Inflammatory Bowel Disease | 0              | 0.0%   | 23          | 100.0% | 23    | 100.0% |  |
| Celiac Disease             | 0              | 0.0%   | 22          | 100.0% | 22    | 100.0% |  |
| Corrosive Ingestion        | 0              | 0.0%   | 7           | 100.0% | 7     | 100.0% |  |
| Foreign Bodies             | 0              | 0.0%   | 23          | 100.0% | 23    | 100.0% |  |
| Total                      | 6              | 1.8%   | 327         | 98.2%  | 333   | 100.0% |  |
| Chi-square                 | X <sup>2</sup> | 28.909 |             |        |       |        |  |
|                            | P-value        | 0.011  |             |        |       |        |  |

Table 3: Frequency of diseases between those who were their age was 1 month or below and those older than 1 month.

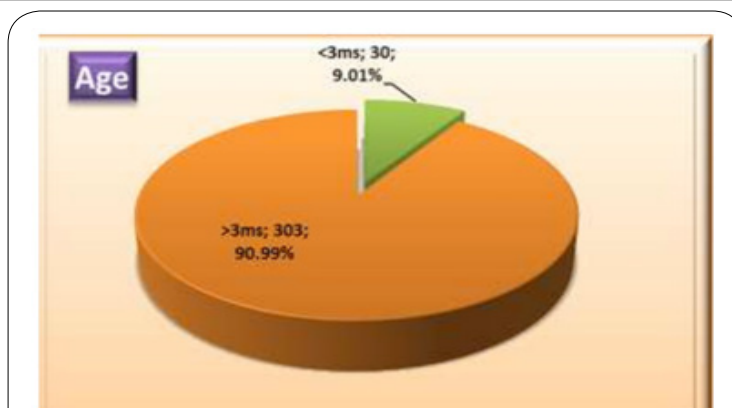


Figure 3: Frequency of diseases between those who were 3 months or younger and those who were above 3 months.

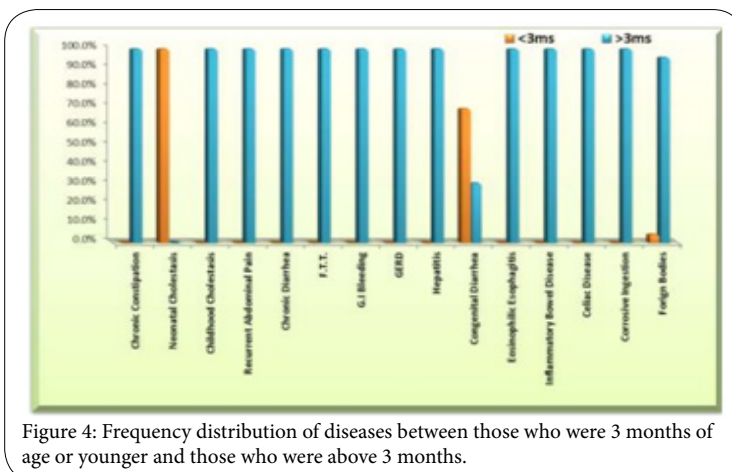


Figure 4: Frequency distribution of diseases between those who were 3 months of age or younger and those who were above 3 months.

when an incremental unit of resources allocated to a service produces equal incremental units of benefits to the service [5,10,11]. At resource levels lower than the efficiency point, a good service can produce benefits that are worth more than the additional costs needed to obtain those benefits. At resource levels higher than the efficiency

point, the benefits produced, although still positive, are worth less than the additional allocated resources[4]. In healthcare, more expensive care may still be "more efficient" because the improvement in patient outcomes and quality of life outweighs the added costs [6,12].

| Diagnosis                  | Gender         |        |      |       | Total |        |  |
|----------------------------|----------------|--------|------|-------|-------|--------|--|
|                            | Female         |        | Male |       | N     | %      |  |
|                            | N              | %      | N    | %     |       |        |  |
| Chronic Constipation       | 31             | 40.8%  | 45   | 59.2% | 76    | 100.0% |  |
| Neonatal Cholestasis       | 8              | 40.0%  | 12   | 60.0% | 20    | 100.0% |  |
| Childhood Cholestasis      | 5              | 41.7%  | 7    | 58.3% | 12    | 100.0% |  |
| Recurrent Abdominal Pain   | 11             | 37.9%  | 18   | 62.1% | 29    | 100.0% |  |
| Chronic Diarrhea           | 11             | 50.0%  | 11   | 50.0% | 22    | 100.0% |  |
| F.T.T.                     | 12             | 75.0%  | 4    | 25.0% | 16    | 100.0% |  |
| G.I Bleeding               | 10             | 58.8%  | 7    | 41.2% | 17    | 100.0% |  |
| GERD                       | 11             | 37.9%  | 18   | 62.1% | 29    | 100.0% |  |
| Hepatitis                  | 5              | 45.5%  | 6    | 54.5% | 11    | 100.0% |  |
| Congenital Diarrhea        | 7              | 53.8%  | 6    | 46.2% | 13    | 100.0% |  |
| Eosinophilic Esophagitis   | 4              | 30.8%  | 9    | 69.2% | 13    | 100.0% |  |
| Inflammatory Bowel Disease | 9              | 39.1%  | 14   | 60.9% | 23    | 100.0% |  |
| Celiac Disease             | 10             | 45.5%  | 12   | 54.5% | 22    | 100.0% |  |
| Corrosive Ingestion        | 3              | 42.9%  | 4    | 57.1% | 7     | 100.0% |  |
| Foreign Bodies             | 11             | 47.8%  | 12   | 52.2% | 23    | 100.0% |  |
| Total                      | 148            | 44.4%  | 185  | 55.6% | 333   | 100.0% |  |
| Chi-square                 | X <sup>2</sup> | 11.352 |      |       |       |        |  |
|                            | P-value        | 0.658  |      |       |       |        |  |

Table 4: Distribution of diseases according to gender.

|                             | N       | Age (years) |   |     |        |   |            |
|-----------------------------|---------|-------------|---|-----|--------|---|------------|
|                             |         | Range       |   |     | Mean   | ± | SD (years) |
| Chronic Constipation        | 76      | 1           | - | 15  | 7.441  | ± | 3.807      |
| Neonatal Cholestasis        | 20      | 1m.         | - | 3m. | 0.154  | ± | 0.051      |
| Childhood Cholestasis       | 12      | 2           | - | 14  | 9.833  | ± | 4.260      |
| Recurrent Abdominal Pain    | 29      | 1           | - | 15  | 7.552  | ± | 4.421      |
| Chronic Diarrhea            | 22      | 1           | - | 15  | 5.136  | ± | 4.109      |
| F.T.T.                      | 16      | 2           | - | 15  | 6.938  | ± | 4.343      |
| G.I Bleeding                | 17      | 2           | - | 15  | 9.353  | ± | 3.904      |
| GERD                        | 29      | 1           | - | 14  | 6.034  | ± | 3.950      |
| Hepatitis                   | 11      | 2           | - | 10  | 4.182  | ± | 2.562      |
| Congenital Diarrhea         | 13      | 1m.         | - | 2   | 0.385  | ± | 0.499      |
| Eosinophilic Esophagitis    | 13      | 2           | - | 14  | 8.769  | ± | 4.438      |
| Inflammatory Bowel Disease* | 23      | 6ms.        | - | 13  | 8.804  | ± | 3.602      |
| Celiac Disease              | 22      | 2           | - | 15  | 10.727 | ± | 4.278      |
| Corrosive Ingestion         | 7       | 2           | - | 5   | 3.286  | ± | 1.380      |
| Foreign Bodies              | 23      | 2ms.        | - | 15  | 4.170  | ± | 3.159      |
| ANOVA                       | F       | 13.291      |   |     |        |   |            |
|                             | P-value | <0.001*     |   |     |        |   |            |

Table 5: Relationship between age and GI diseases.

| Risk factor               | N  | %    |
|---------------------------|----|------|
| Family history            | 20 | 86.9 |
| History of appendectomy   | 15 | 65.2 |
| High socioeconomic status | 21 | 91.3 |

Table 6: Risk factors for inflammatory bowel diseases.

## Conclusion

This study will enable us to plan the care roles of the pediatric gastrointestinal disease at the city of Makah. It will alert the directory of the ministry of health to launch an appropriate health education for people in Makah regarding the prevention of common problems like constipation which consume good proportion of the pediatric G.I clinic time. To educate the general pediatrician how to deal with simple common G.I disease (i.e. chronic constipation), how to treat it and the referral to G.I is only for the resistant cases.

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## Conflict of Interest

The authors declare no competing interest.

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