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Systematic Evaluation of Preemptive Nasogastric Decompression Following Abdominal Surgeries

(Original Research Article)

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Abstract

Background: Routine use of nasogastric tubes (NGTs) after abdominal surgeries aims to reduce anastomotic leakage risk, avoid pulmonary consequences, and shorten hospital stays while also promoting patient comfort. The effectiveness of this approach following abdominal surgery in accomplishing each of these aims is investigated in this meta-analysis of published trials.

Method: The Cochrane Controlled Trials Register, Medline search, Embase, and references from included studies were used in the search. The search terms were "randomised, nasogastric tubes," etc. Patients undergoing abdominal surgeries of any kind, whether emergency or elective, who were randomly assigned before the operation to receive a nasogastric tube and keep it in place until intestinal function had returned or to selective use of a tube with early removal were included in the studies that qualified.

Results: 21 studies met the qualifying requirements. These patients totaled 3034, with 1466 receiving a selective or no tube and 2108 receiving a regular tube. Those who did not usually receive a nasogastric tube had an earlier recovery of bowel function (P more than 0.001), a slight reduction in pulmonary problems ($P=0.07$), and slight increases in wound infection and ventral hernia ($P=0.075$ and $P=0.085$, respectively). Anastomotic leakage was comparable between the two groups ($P=0.70$).

In conclusion: routine nasogastric decompression should be replaced with selective nasogastric tube use because it does not achieve any of its claimed purposes.

Keywords: Abdominal operations; Functional recovery; Length of stay; Nasogastric decompression; Postoperative complication; Routine vs Selective use.

Introduction

Over the past 200 years, tubes have been introduced through the nose or mouth to remove fluids and gas from the stomach. Such an activity may be performed for therapeutic purposes (as in the case of patients experiencing distension and vomiting due to bowel obstruction), diagnostic purposes (as in the case of gastrointestinal bleeding or peptic ulcer disease), or prophylactic purposes (as in the case of patients undergoing major abdominal surgery). Only in the past century has the preventive use of nasogastric tubes—flexible tubes put via the nose, pharynx, esophagus, and stomach—become so common that it has been alternately referred to as "the standard of care"¹ and "traditionally utilised by most surgeons"² up until 2002., "common procedure,"³⁻⁵ "unquestioned,"⁶ and "routine,"⁷.

Gastric decompression, a decreased risk of nausea and vomiting, a reduction in distension, a decreased risk of pulmonary aspiration and pneumonia, a decreased risk of wound separation and infection, a decreased risk of fascial dehiscence and hernia, an earlier return of bowel function, and an earlier discharge from the hospital are the goals of this prophylaxis.

There have been several published studies evaluating the effectiveness of this intervention. Although vomiting and distension were more frequent when nasogastric tubes were not routinely used, a meta-analysis of many randomised and non-randomized studies published before 1995 discovered that all other variables of efficacy were actually better for those who did not have routine insertion and maintenance of nasogastric tubes in the postoperative period.⁸

Lots of studies have suggested that routine nasogastric decompression is unnecessary after elective laparotomy and may be associated with an increased incidence of complications. Despite these reports, many surgeons continue to practice routine nasogastric decompression, believing that its use significantly decreases the risk of postoperative nausea, vomiting, aspiration, wound dehiscence, and anastomotic leak.

For a number of reasons, this meta-analysis needs to be updated and corrected. First, since 1998, a large number of studies have been published, expanding the range of abdominal operations involving nasogastric tubes, including procedures for gastric cancer and urgent procedures for penetrating abdominal damage.

The results of the original paper could have significant selection bias because it also included non-randomized trials in the meta-analysis. Since a sizable number of pertinent randomised clinical trials (RCTs) have been reported as of late, the present systematic review is solely based on these.

Methods

RCTs that compared people who routinely used nasogastric tube gastric decompression as a preventative measure following abdominal surgery were included. Adults over the age of 20 who underwent abdominal procedures made up the study's patients. All types of procedures were covered, including emergency and urgent operations for penetrating abdominal trauma and major vascular reconstruction, as well as common operations for gallstones, gastric cancer, and other conditions. There is no discussion of Minimal Access Surgery (MAS) in the article.

A nasogastric tubing was placed in the test group either before or during surgery and was left in place until bowel function was restored. This is a slightly ambiguous endpoint, although it generally refers to the postoperative, spontaneous passage of flatus, which often takes place 3–5 days following surgery. In the control group, no tubes were inserted during surgery, or tubes were inserted during surgery and removed either while the patient was still in the operating room, in the recovery room, after it was determined that they were completely conscious, or within 24 hours of the surgery.

Rubber Levine tubes or any other tube of a comparable length, like polymer tubes with sump lumens, might have been utilized. The evaluation excludes individuals who had gastrostomy tubes (long tubes put through the abdominal wall into the stomach) and patients who had long tubes used for bowel obstruction in the past (such as Dennis tubes, Cantor tubes, and Miller-Abbott tubes).

Time to first flatus, pulmonary complications (a composite of atelectasis and pneumonia), fever, wound infection, length of hospital stay, or postoperative hospital stay, wound dehiscence, anastomotic leak, ventral hernia, nausea and/or vomiting, need for tube insertion/reinsertion, death, pain or discomfort associated with the tube, and adverse events associated with tube insertion were among the outcome measures sought.

The terms "nasogastric, tubes, and "randomized" were part of the search technique used to find papers for this review. Medline, Embase, the Cochrane Controlled Trials Register, and reference lists from published studies and reviews were the sources used. The review was done as a class assignment for the University of Illinois at Chicago's Honors 201 seminar. Students in the class created a data abstraction form (available from the authors on request). Each article was read by pairs of students, and all identified

studies were then presented to the class for discussion and resolution of any differences in the interpretation of the data.

In each case, the randomization procedure, concealment, blinding, definition of inclusions, exclusions, number of dropouts, intention-to-treat analyses, and consistency of interpretations with the data were examined to determine the quality of the studies.

When both means and standard deviations were provided, continuous variables like time to flatus and length of hospital stay were evaluated using the weighted mean difference in Meta view, and random effects if considerable heterogeneity was discovered. In order to include more studies in the meta-analysis, a method for imputing standard deviations from published *P* values and *t* tables was used when means were reported without them. *P* values of 0.03 and 0.3 were applied, respectively, when no *P* value was provided but results were merely declared as "significant" or "not significant." Many studies provided median times to hospitalisation or flatus, frequently with a range and *P* value. Without means and standard deviations provided by the authors, these could not be included in the main meta-analysis. Sensitivity analyses were carried out to evaluate the impact of low-quality studies on the overall results, to evaluate the impact of imputed standard deviations from *P* values on the overall results, and to locate the sources of significant heterogeneity when it appeared. Sensitivity analyses were also carried out to evaluate how well prophylactic nasogastric decompression performed on various kinds of abdominal procedures. The initial randomised number, not only for those who completed the assessment, served as the denominator in all analyses. We got in touch with the publications' authors to get any missing data or analysis.

Results

Study descriptions

The required number of studies were 21, which were eligible. One⁹ was a follow-up report from a group of patients who had previously been profiled⁷ with a new outcome (abdominal hernia). These research covered a wide range of abdominal procedures; there were six papers on colorectal surgery^{3,7,10-14}, five papers on gastroduodenal surgery^{2,15-20}, one paper on biliary^{21,22}, and two papers on gynecological^{23,24}, one paper on vascular²⁵, and one paper on emergency trauma²⁶, and five papers that covered every aspect of abdominal surgery^{1,4,6,27-30}. The included publications provided information on 3034 patients, 1466

of whom were randomly assigned to receive a prophylactic nasogastric tube for postoperative decompression, and 1568 of whom were randomly assigned to receive no tube at all.

Five studies were disregarded because they were not RCTs^{31,32}, employed gastrostomies for decompression³³, only assessed gastro-esophageal reflux as an endpoint⁵, or did not have a group in which tubes were kept in place until gastrointestinal function was restored³⁴.

Methodological quality

Only seven studies provided an adequate allocation sequence:^{3, 6, 7, 15, 17, 20, and 22}. The method of randomization was not disclosed in the majority of the other cases, however, in one it was by month of birth¹⁷. In three investigations, allocation concealment was mentioned^{19,20,27}. It was never attempted to blind participants or observers because it was impossible to do so. Drop-outs should have been uncommon with such a brief intervention in patients confined to hospitals. Four studies were the only ones to reveal drop-out rates higher than 12%^{1,2,15,19}. Numerous papers^{6,17,18} had poorly defined or nonexistent inclusion criteria, while others^{3,6,15,17,28} found it difficult to compare the two participant groups.

The subjectivity in reporting the primary endpoint of the research, namely the restoration of gastrointestinal function, was possibly the major quality concern. The time to first flatus was measured, however the patient normally informs the surgeon that this happened before the ward round, which happens in the early morning. This measurement definitely has some inherent imprecision. Patients with tubes may have had an incentive to report flatus in order to get rid of the tubes, but it is not immediately clear how this imprecision may have consistently influenced reporting in favour of "no tube". The pulmonary problems main endpoint might have been reported with more accuracy.

Outcome measures

The relative risk (also known as risk ratio [RR]) is the ratio of risk of an event in one group (e.g., exposed group) versus the risk of the event in the other group (e.g., nonexposed group).

The odds ratio (OR) is the ratio of odds of an event in one group versus the odds of the event in the other group.

A confidence interval (CI) is the mean of your estimate plus and minus the variation in that estimate. This is the range of values you expect your estimate to fall between if you redo your test, within a certain level of confidence. Confidence, in statistics, is another way to describe probability.

Time to flatus.

Even though this was based on only eight studies, there was a significant benefit from non-routine use of postoperative nasogastric decompression (*weighted mean difference* of 0.48 days (95 percent *confidence interval (CI)* 0.28 to 0.64); *P* less than 0.001), using only studies that provided precise standard deviations with the mean (**Fig. 1**). The remaining studies either used *P* values or general comments of "significant" or "insignificant" findings unplace of standard deviations. Many other trials, typically with *P* values, merely provided median times until flatus returned as proof of the recovery of gastrointestinal function.

An attempt was made to include these additional studies by imputing standard deviations from the *P* values, using in some cases a technique described in a Cochrane Colloquium by Wolf and Guevara³⁷. When results were described as 'significant' a *P* value of 0.03 was assigned, and for 'insignificant' a *P* value of 0.3 was assigned. The broader inclusion resulted in an almost identical summary odds ratio in the meta-analysis, although somewhat narrower confidence intervals, but with the introduction of significant heterogeneity ($I^2 = 74.2$ percent, $P < 0.001$). Considering only patients who had colonic surgery in studies providing precise standard deviations, an earlier return of bowel function occurred in patients without a tube.

Pulmonary complications

Nineteen studies reported the incidence of postoperative pulmonary complications (an amalgam in this report of pneumonia and atelectasis) by group. Non-routine use of nasogastric suction provided a benefit that approached statistical significance (*The relative risk* RR 1.35 (95 percent *(CI)* 0.98 to 1.86); $P = 0.07$) (**Fig. 2**), without evidence of statistical heterogeneity. A subgroup analysis of studies that considered only individuals who had colonic surgery showed no difference in pulmonary complication risk ($P = 0.73$). Among those who had upper gastrointestinal surgery the risk of pulmonary complications was lower in those without a tube, but this only approached statistical significance ($P = 0.08$).

Wound infection

Infections in the wounds were recorded in 15 trials, and the summary statistic revealed that routine nasogastric decompression reduced the threat, but this only grew close to statistical significance (*The Odds ratio* OR 0.72 (95%) *(CI)* 0.50 to 1.04); $P = 0.08$) (**Fig. 3**). In those five studies, there was no post-operative pain from the upper gastrointestinal operation and no difference in the probability of wound infection ($P = 0.62$).

Ventral hernia

One study reported long-term follow-up for the development of ventral incisional hernia⁹ and there was no difference between groups (OR 0.47 (95 percent (CI) 0.20 to 1.13); $P = 0.09$) (**Fig.4**).

Anastomotic leak

Nine studies reported anastomotic leak, and there was no difference between groups in this outcome (OR 0.86 (95 percent (CI) 0.39 to 1.90); $P = 0.70$) (**Fig. 5**). In three studies of those who had colonic surgery only, there was also no difference in risk of anastomotic leak between groups.

Length of stay

Seven studies provided median hospital stay lengths with specific standard deviations, other studies provided P values, and still other studies provided median stay lengths. Although the variability found in calculating a combined effect ($I^2 = 92.5$ percent, P less than 0.0001) made it inappropriate to offer a summary statistic, most patients showed a shorter length of stay without a tube. Sensitivity analyses that were conducted in an effort to identify a particular reason for the heterogeneity were ineffective.

Upset stomach and other consequences.

Nineteen studies described a range of postoperative stomach distress, from nausea to vomiting to discomfort. The majority of participants reported higher discomfort with routine tube usage, although it would be imprudent to provide a summary statistic for this result due to the extreme heterogeneity observed in the computation of a combined effect ($I^2 = 62\%$, P less than 0.001). Other outcomes, including as death, tube reinsertion, fever (often accompanied with pulmonary problems), and wound dehiscence, were not documented frequently enough to be instructive. The number of studies that were subjected to sensitivity analyses that only included high-quality research was significantly reduced.

Adverse events

Although major adverse events directly related to tube insertion have been reported, such as intracranial insertion³⁵ and esophageal perforation³⁶, no adverse event related specifically to tube insertion was reported in any of the included studies.

Sensitivity analyses

Above are the findings from sensitivity studies on quality, confidence interval imputing, and the investigation of statistical heterogeneity. Regarding the benefit of nasogastric decompression in various abdominal operations, patients undergoing colorectal surgery performed better without a tube (*weighted mean difference* (WMD) 0.62 (95 percent confidence interval (CI) 0.28 to 0.96; two studies), those undergoing gastric surgery performed marginally but not significantly better without a tube (WMD 0.12

(95 percent *CI*) 0.15 to 0.39; three studies), and patients. In other words, the outcomes of the three different types of operations were comparable.

Regarding comparisons of pulmonary complications, patients undergoing colorectal surgery performed only marginally better without a tube (OR 1.33 (95% *CI*) 0.27 to 6.62; four studies), those undergoing gastric surgery performed marginally better without a tube (OR 1.52 (95% *CI*) 0.95 to 2.43; six studies), and those undergoing gynaecological operations performed significantly worse without a tube (OR 0.74 (95% *CI*) 0.39 to 1.41). The effectiveness of preventive nasogastric decompression in no type of operation was related to the amount of time to flatus or the likelihood of pulmonary problems.

Discussion

Only 13 of the 21 trials were RCTs, and five non-randomized trials were included even in the sensitivity analysis of higher-quality trials. There was a huge variety of outcome measures provided. Each of these measures was reported in an unnamed trial. Participants who used a nasogastric tube until a moment in the recovery period when intestinal function was perceived (flatus, feeding, or defecation) and a group referred to as "selective usage" served as the two comparison groups.

This may be a more insightful category than "no tube," as participants who required a tube to be inserted due to post-operative vomiting or distension did not indicate treatment failures in that group but rather effective judgmental use of the tube. Additionally, in the majority of reported RCTs, the nasogastric tube was indeed placed in both groups' participants, but it was removed from one group either during surgery, in the recovery area, or 24 hours afterwards. There was a sizable risk of emesis, distension, and tube reinsertion in the selected group. There was a sizable risk of pulmonary problems in the tube group.

No significant difference was noted for the onset of feeding, pulmonary aspiration, wound infection, length of stay, death, or overall complications. The inclusion of nonrandomized studies and the lack of specificity for the outcome measures weaken this publication.

Comparatively, in the current systematic review, only RCTs were included, with nearly twice as many trials covering a wide spectrum of abdominal surgery and more clearly defined end measures. The nature of reporting the continuous outcomes, "time to flatus" and "duration of stay," was the main issue. Many times, *P* values rather than confidence intervals for each group were provided.

Due to the imprecision that this procedure introduced, the process of imputing means and confidence intervals from *P* values significantly increased heterogeneity. The inclusion of these trials in the meta-

analysis was further prevented by the fact that many other RCTs reported time to flatus and duration of stay using medians and *P* values rather than means and confidence intervals.

The findings from these comparisons were supported by the absence of heterogeneity in the meta-analyses for the end variables time to flatus (where only trials providing confidence intervals were included), pulmonary complications, wound infection, and anastomotic leak. A meta-analysis should not be reported for these outcome variables because heterogeneity persisted despite subgroup analyses for length of stay and the indicators of patient tolerance for the tube (nausea and vomiting). Sensitivity analyses have demonstrated that the effectiveness of preventive nasogastric decompression is comparable across a wide range of abdominal surgeries, despite having less statistical power. These results, together with the statistical heterogeneity studies, justify the inclusion of all types of abdominal surgery in a single systematic review.

In conclusion

The goal of prophylactic nasogastric decompression after abdominal procedures is to reduce the risk of pulmonary complications by easing breathing, reducing the risk of aspiration of gastric contents, hastening the return of bowel function, improving patient comfort by reducing abdominal distension, safeguarding intestinal anastomoses and preventing anastomotic leakage, and shortening hospital stays. For every single patient requiring insertion of a nasogastric tube in the postoperative period, at least 20 patients will not require nasogastric decompression.

This analysis has demonstrated that none of these objectives will be met by the intervention and routine nasogastric decompression is not supported by meta-analysis of the literature. Avoiding prolonged intubation and inserting tubes only when necessary to treat stomach symptoms may have significant benefits.

When routine intubation is avoided, wound infection (and one of its consequences, an incisional hernia), may be more common; the reasons for this remain unclear. Already, a lot of surgeons refrain from routine nasogastric intubation. Those who don't likely ought to.

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express special thanks for their help include critically review colleagues of the manuscript and for people working in IT Department, Biostatistics Department and Medical Registry Archives.

Finally, I hope that this work will prove to be useful and beneficial to all medical staff, paramedics and allied professionals. Indeed, I dedicate this work to all junior doctors who will take this effort to practice, develop and lead this demanding but rewarding profession.

Declaration:

I hereby declare that this research title is an original report of my work, has been written by myself, and has not been submitted before to any institution or journal. Furthermore, I have acknowledged all sources used and have cited them in the reference section.

Competing interests:

The author declare that he has no competing interests.

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SYSTEMATIC EVALUATION OF PREEMPTIVE NASOGASTRIC DECOMPRESSION FOLLOWING ABDOMINAL SURGERIES

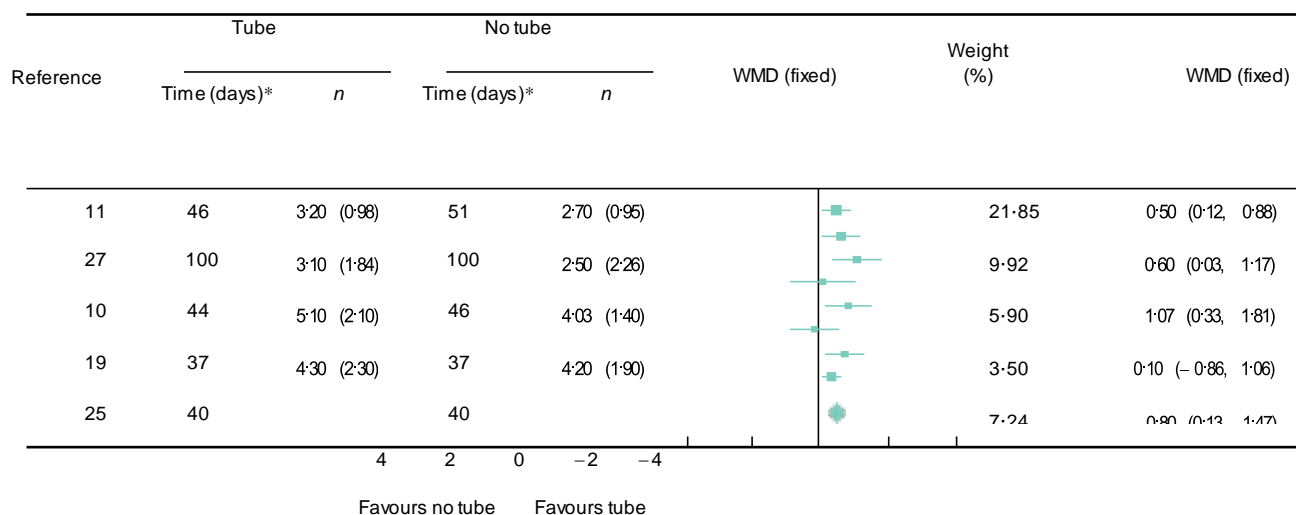


Fig.1 Analysis of time to flatus. * Values are mean(s.d.). Weighted mean differences (WMDs) are shown with 95 per cent confidence intervals. Test for heterogeneity: $\chi^2 = 9.18$, 7 d.f., $P = 0.24$, $I^2 = 23.8$ per cent; Test for overall effect: $Z = 5.00$, $P < 0.001$

Reference	Proportion with pulmonary complications		RR (random)	Weight (%)	RR (random)
	No tube.	Tube			

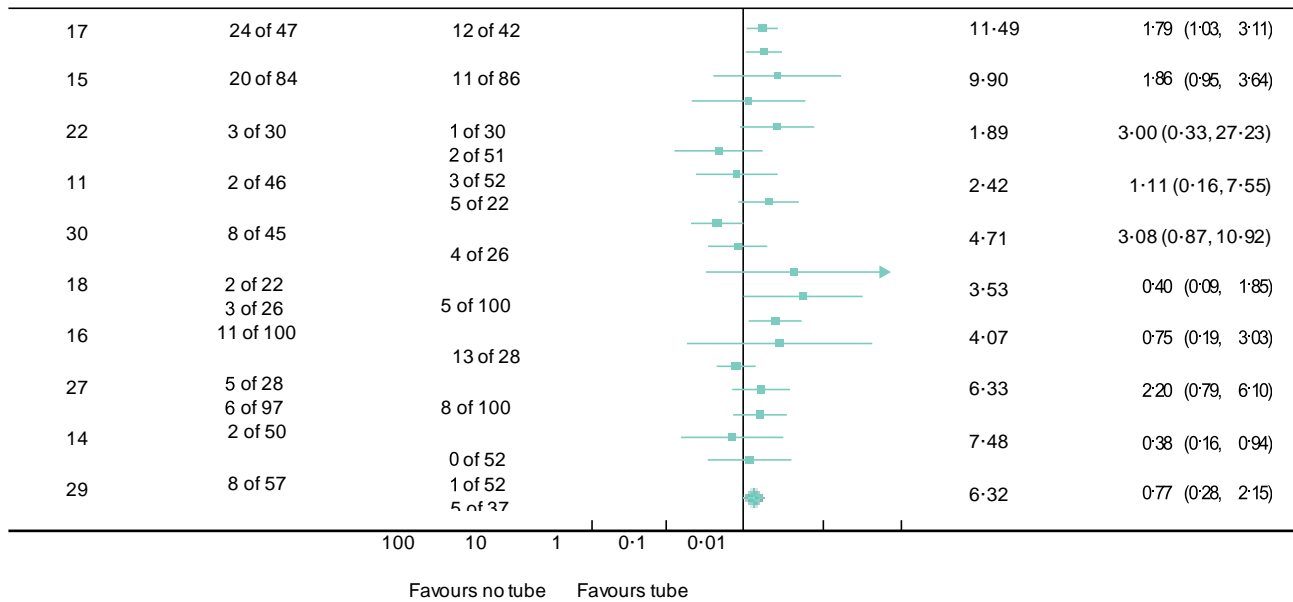


Fig. 2 Analysis of incidence of pulmonary complications (atelectasis and pneumonia). Relative risks (RRs) are shown with 95 per cent confidence intervals. Test for heterogeneity: $\chi^2 = 27.49$, 18 d.f., $P = 0.07$, $I^2 = 34.5$ per cent; Test for overall effect: $Z = 1.83$, $P = 0.07$

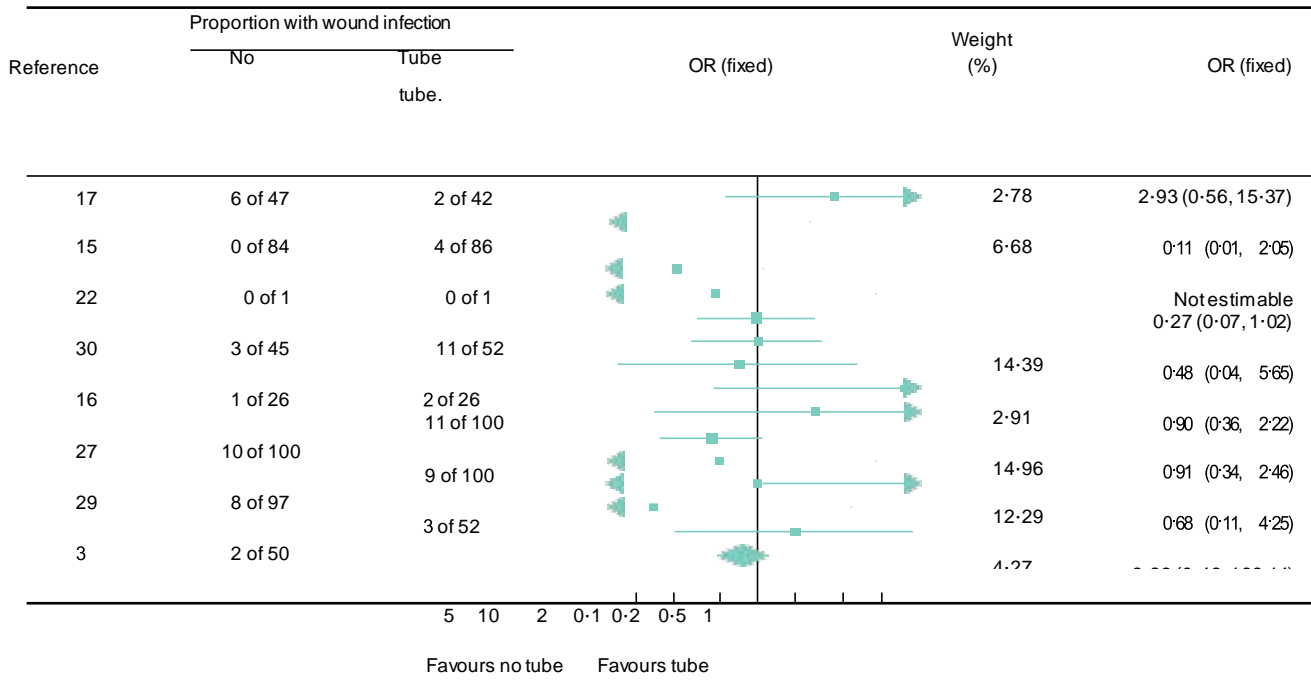


Fig.3 Analysis of incidence of wound infection. Odds ratios (ORs) are shown with 95 per cent confidence intervals. Test for heterogeneity: $\chi^2 = 13.62$, 13 d.f., $P = 0.40$, $I^2 = 4.6$ per cent; Test for overall effect: $Z = 1.74$, $P = 0.08$

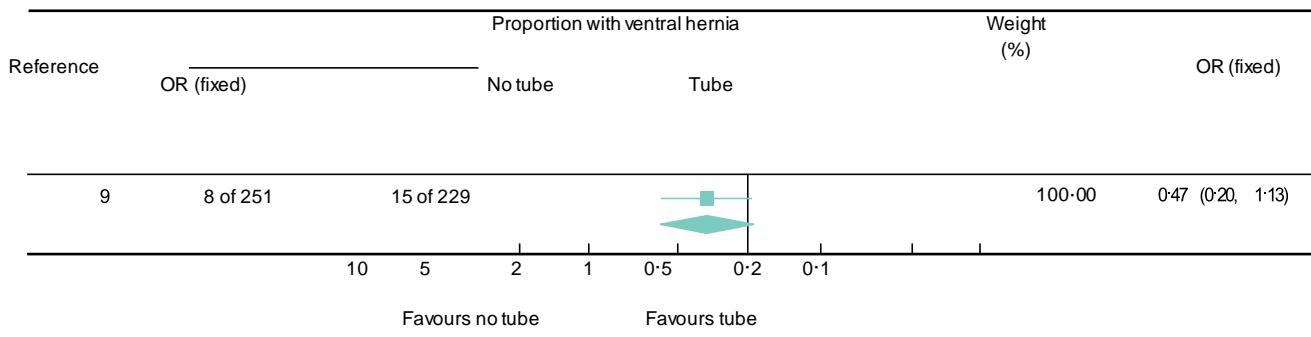


Fig.4 Analysis of incidence of ventral hernia. Odd ratios (ORs) are shown with 95 per cent confidence intervals. Test for overall effect: $Z = 1.69$, $P = 0.09$

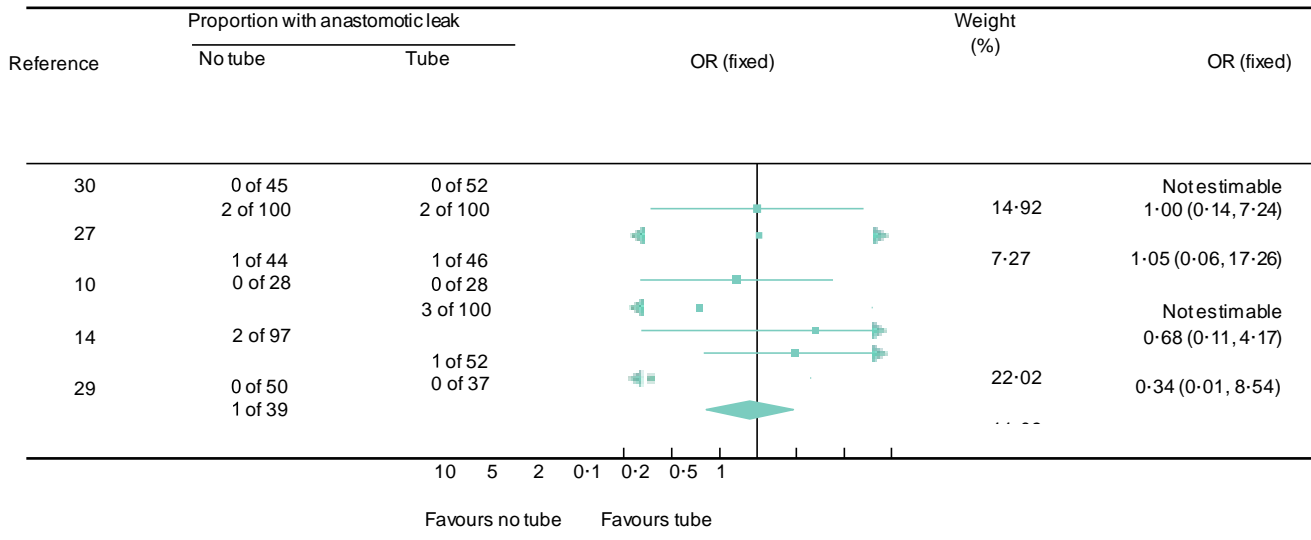


Fig.5 Analysis of incidence of anastomotic leak. Odds ratios (ORs) are shown with 95 per cent confidence intervals. Test for heterogeneity: $\chi^2 = 3.43$, 6 d.f., $P = 0.75$, $I^2 = 0$ per cent; Test for overall effect: $Z = 0.38$, $P = 0.70$

Hepatitis (A) Rates in Derna, Libya in 2019 and Suitable Nourishment

(Original Research Article)

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Abstract

The current study gives a brief explanation about the outbreak of hepatitis A epidemic in the city of Derna in Libya from June to December 2019. Approximately, 959 positive cases of hepatitis A were recorded. Of 959 cases, 675 cases (401 males and 274 females) were collected from multiple places in Derna including Al-Sahel Al Shargy, Bab Tobruk, Al-Jebella, Sheha, Embegh, Al-Fatayah, Theel Al-Wady, Al-Balad, Al-Mohasha, Al-Maghar, Wadi Al-Naga, Baten Bomansour, Al-Sayada Khadja, and Karsa. Data were also gathered from different locations in Eastern Libya including Al-Beda, Guba, Gaygab, Al-Dabosia, and Om Rosam. A face-to-face survey was performed on 208 individuals diagnosed with hepatitis A and their families at their residence places in Derna during the period from 26th June to 11th September 2019. Questions were focused on lifestyle factors including eating fast foods from restaurants, source of drinking water, source of fruits and vegetables they consumed, and types of foods they mostly ate. The approximate percentage of males and females were 59.1 % and 40.6%, respectively. This explains that males are almost 18.5% more likely than females to be susceptible to infect with hepatitis A. There was statistically significant difference between men and women for their infection with hepatitis A ($P= 0.035$). The great infection with hepatitis A was in Al-Sahel Al-Shargi with a percentage of 38.8% (64 Cases). The results showed that there was statistically significant difference between people infected with hepatitis A virus according to their place of residences ($P= 0.018$). The unifying factor between 208 interviewed patients was drinking water contaminated with sewage. About, 70% of patients ate meals from popular fast-food

restaurants. While 30% of patients ate vegetables and fruits coming from Egypt and irrigated with sewage water. A highly nutritious dietary program may be essential to prevent liver damage.

Key Words: Hepatitis A, Outbreak, Derna, Al-Sahel Al-Shargi, contaminated water with sewage.

Introduction

The hepatitis A virus considers one of the most frequent reasons of food borne infections. It represents as a viral infectious liver illness caused by hepatitis A virus (HAV) (Cuthbert 2001; Safiabadi et al 2017). The incubation period of hepatitis A is commonly from 14 to 50 days (generally 25 days). The sickness is typically mild, with symptoms take place in most of patients with hepatitis A. The hepatitis A virus is transmitted principally by the faecal-oral way. The infection happens when an uninfected person consumes food or water that has been polluted with the faeces of an infected person (WHO 2019). A human being experiencing infectious hepatitis A will suffer from “severe loss of appetite, fever and jaundice, itching, nausea, dark urine, vomiting, abdominal pain, taste changes, pale-colored stool, joint pain, diarrhea, and fatigue”. All these signs confuse food intake and make it difficult to verify that the patient is well nourished at a time. Therefore, is essential to support the patient with a highly nutritious dietary program to prevent liver damage. The disease has a tendency to go away after about 2 months but may be remain for up to 6 months (American Liver Foundation 2005). A person diagnosed with hepatitis A is able to have and spread hepatitis A, even if that person does not have any symptoms. In detail, adults are no longer infectious 2 weeks after the sickness begins. Kids and citizens who have weak immune systems may be infectious for up to 6 months (American Liver Foundation 2005; WHO 2019).

There are numerous explanations about causes of hepatitis A infection. These causes include having sex with someone who has it, sometimes mother does not wash her hands properly after changing the diaper of her infected kid and a caregiver does not wash his or her hands appropriately after cleaning up the stool of patient with hepatitis A (Fiore 2004). Also, a person may touch his mouth after touching a contaminated object, as well as the traveling to the contaminated countries. Additionally, people drink water has been polluted by someone faeces and may consume fruits, vegetables, or

other foods prepared by a person who has the virus. Moreover, people eat raw shellfish harvested from water where the virus lives, or they swallow polluted ice. There is no accurate drug to treat hepatitis A and most patients are self-limited as most patients get rid of the illness on its own in the course of a few months (American Liver Foundation 2005; Kemmer and Miskovsky 2000; Ledner et al 1985). “WHO adopted the first Global Health Sector Strategy on Viral Hepatitis, 2016-2021”. The strategy has an idea of removing viral hepatitis as a community health emergency. Plus, the plan is to achieve the worldwide objectives of reducing new viral hepatitis infections by 90% and decreasing fatalities due to viral hepatitis by 65% in next 2030. The plan also contains formulating evidence-based policy, statistics for action, preventing transmission, elevating screening, care and treatment services (Who 2019).

The importance of this study emerged because of many reasons. Firstly, the response to find solutions to the health crisis happened in Derna city which was exposed to hepatitis A outbreak during the last six months in 2019. Secondly, the emergence of concern about this epidemic disease may continue and spread in neighboring cities. Thirdly, for fear that hepatitis A will constitute a major burden on health sector of Libya. Fourthly, the spread of unhealthy food habits in Libyan society and the weak nutritional culture of many people in Libya. Fifthly, Libyan society becomes accept the vital role of nutrition in maintaining human health and protecting it from epidemic hepatitis A. sixthly, people’s health is precious and requires to find solutions to this crisis. This work is aimed to study the size of hepatitis A outbreak in Derna, Libya from June to December 2019; and to perform a face-to-face survey on individuals diagnosed with hepatitis A and their families at their residence places in Derna during the period from 26th June to 11th September 2019. Also, it is to explain the appropriate diet for treat hepatitis A disease.

Methodology

Data Collection and Analysis

Statistics were obtained from the National Center for Disease Control, Derna, the Office of Monitoring and Rapid Response, Primary Health Care Department, Derna, Libya. A total of 959 cases infected with hepatitis A were recorded from June to December 2019. About 675 cases (401 males and 274 females) were analyzed in this research study. Data collected from multiple places in Derna, Libya including Al-Sahel Al Shargy, Bab

Tobruk, Al-Jebella, Sheha, Embegh, Al-Fatayah, Theel Al-Wady, Al-Balad, Al-Mohasha, Al-Maghar, Wadi Al-Naga, Baten Bomansour, Al-Sayada Khadja, and Karsa. As well as data were obtained from different locations in Eastern Libya including Al-Beda, Guba, Gaygab, Al-Dabosia, and Om Rosam. Hepatitis A virus (HAV) blood test was performed in Al-Wahada Hospital, Health Centers, as well as Iben Roshed, Al-Razi, Ibn Sena, Al-Rasheed Laboratories, Derna, Libya. Graphs and percentage formulas of patients with hepatitis A were calculated using Microsoft office excel 2020 program.

A Face-To-Face Survey Study

A face-to-face survey study was carried out on 208 individuals diagnosed with hepatitis A (HAV) and their families at their residence places in Derna city during the period from 26th June to 11th September 2019. This survey assists the researcher to find solutions and decisions to solve the hepatitis A outbreak crisis in Derna city. Data was collected on a form (questionnaire) during the interview. Participants were asked to detail their nutritional habits before getting hurt hepatitis A. Also, the questions were focused on lifestyle factors including eating fast foods or meals from restaurants, source of drinking water and source of fruits and vegetables that they consume, as well as types of foods they mostly consumed.

Ethical Considerations

This study protocol was approved by the ethics committee of the Scientific Research Center in Derna University. Also, it was performed under the supervision of the National Center for Disease Control, Derna, Libya. All patients diagnosed with hepatitis A were informed about the research and gave their verbal consent to fill the questioner form.

Statistical Data Analysis

Descriptive statistics were performed using SPSS Statistics Software Program (version 20, Inc., Chicago, Illinois, USA). The Pearson Chi-square test was used to assess the

significance of the association between males and females being diagnosed with hepatitis A virus according to their sex and place of residence.

In all tests, $\alpha < 0.05$ was regarded statistically significant. All confidence intervals (CIs) were calculated at the 95% level of statistical significance.

Results and Discussion

Hepatitis an Outbreak in Derna from June to December 2019

The National Center for Disease Control, Derna, Libya stated that there were approximately 959 positive cases of hepatitis A virus during the last six months of 2019 in Derna city. Derna city is located on Mediterranean coast east of Benghazi city. It is laid on the eastern ridge of Jabel El Akhdar in the delta of the small Wadi Derna (Kezeiri 1982). Among 959 cases, approximately 675 cases (401 males and 274 females) were analyzed in this research study (Figure 1).

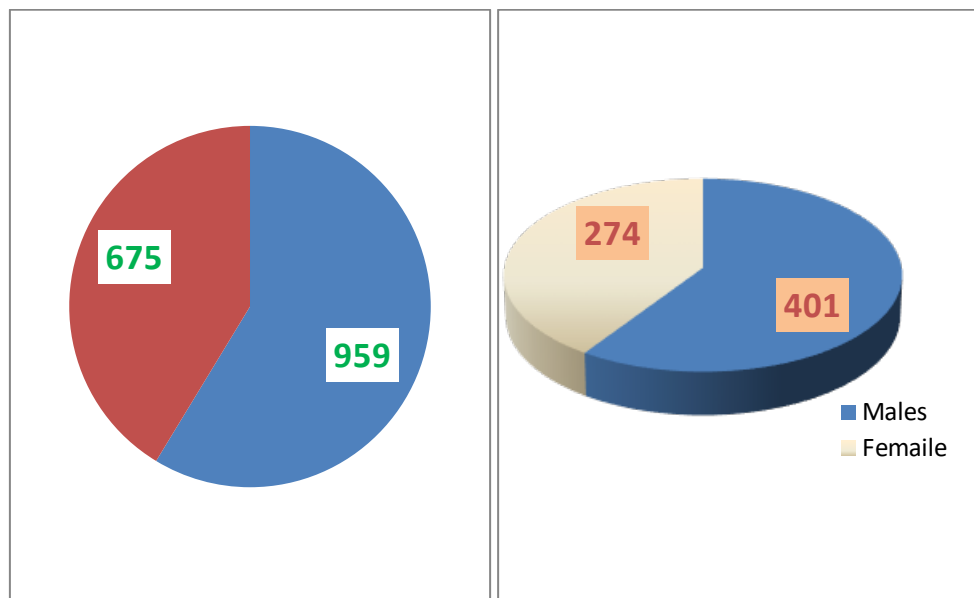


Figure 1: Total Number of Cases (n= 959) and Number of Males and Females Infected with Hepatitis A.

Referring to Figure 1, the approximate percentage of males and females were 59.1 % and 40.6%, respectively. This gives details that males are almost 18.5% more likely than females to be susceptible to infect with hepatitis A virus.

The descriptive statistic using Chi-square test (χ^2) (test of significance in qualitative data) found that there was statistically significant difference between men and women for their infection with hepatitis A ($P= 0.035$). Although a previous study reported that females are more infected with viral infection than males (Scott and Litin, 2001).

Places of Hepatitis A Virus Outbreak in Derna

Of 675 cases infected with hepatitis A virus, about 165 cases live in different parts in Derna City (Figure 2). One of the important finding in this work showed that the great infection with hepatitis A virus was in Al-Sahel Al-Shargi with a percentage of 38.8% (64 Cases), followed by Al-Gebela , Al-fatayah, Sheha, Bab-Tobruk and Karsa with a percentage of 10.3% (17 cases), 10.3% (17 cases), 9.7% (16 cases), 8.5% (14 cases), 7.3% (12 cases), respectively. The significant increase in hepatitis A viral infection rates may suggest that there is a common factor causing the infection between different places in Derna city. As a comparison, the other places in Derna showed smaller infections with hepatitis virus including: Al-Balad, Al-Maghar, Sayadah Khadeja, Shareaa Al-Bahar, Impagh, Wadi Al-Naga, Theel Al-Wadi, Baten Bomansour and Al-Mohsha with a percentage of 3% (5 cases), 3% (5 cases), 2.4% (4 cases), 1.8% (3 cases), 1.8% (3 cases), 1.2 % (2 cases), 0.6% (1 cases), respectively. Another finding in this study demonstrated that some places in Derna City had equal infections with viral hepatitis A including Al-Gebela with Al-fatayah, Al-Balad with Al-Maghar, Shareaa Al-Bahar with Impagh, Theel Al-Wadi with Baten Bomansour and Al-Mohsha (Figure 2). The results showed that there was statistically significant difference between people infected with hepatitis A virus according to their place of residence ($P= 0.018$).

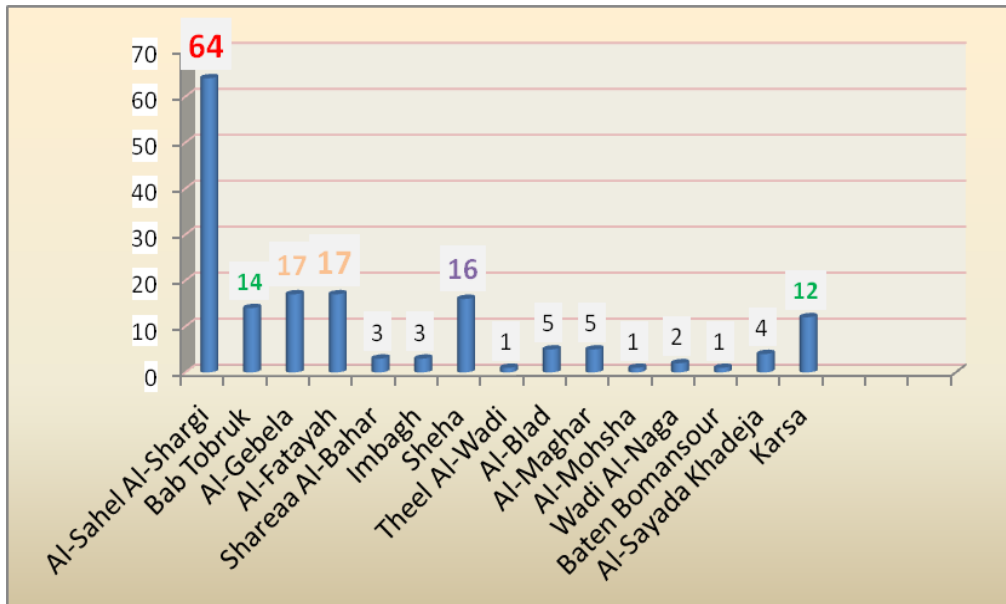


Figure 2. Distribution of Cases Infected with Hepatitis An According to Different Places in Derna, Libya (n= 165).

The present study gives an indication that hepatitis A virus infected a number of people in Derna city is coming from a specific source. This specific source should be a water or food borne. To compare with a hepatitis A viral outbreak that occurred twenty years ago in USA, this virus infected a large number of people and linked to fresh blackberries which considered as food borne outbreak (Cuthbert 2001).

Hepatitis an Incidence in Areas outside Derna

According to the registry office of the National Center for Disease Control, Derna, Libya, there were 24 cases infected with hepatitis A virus from different locations in Eastern Libya. Of 24 cases infected with hepatitis A virus, about 10 cases from Guba city and 7 cases from Ain Mara area, while 3 cases from Om Rasam city (Figure 3). Due to the proximity of these areas to Derna City, the viral infection may have been transmitted because of the same reasons that appeared in Derna city.

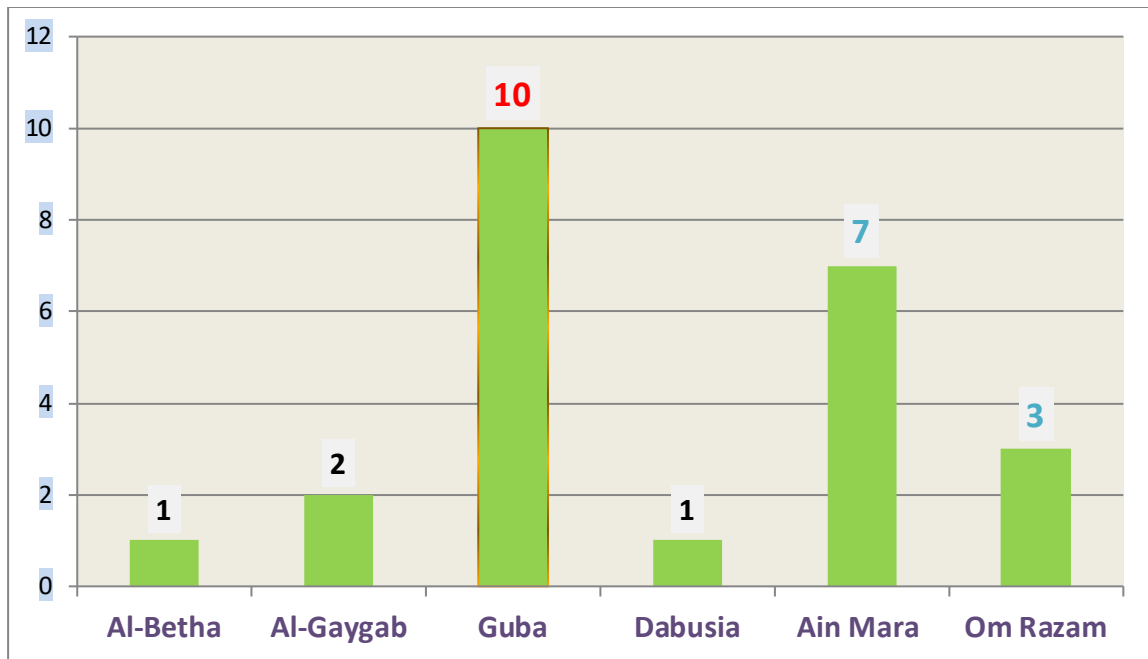


Figure 3. Distribution of Cases Infected with Hepatitis A According to Different Cities in Eastern Libya (n= 24).

In addition, the National Center for Disease Control and the Monitoring and Rapid Response Center, Primary Health Care Department, Derna documented that there is no death among the cases diagnosed with hepatitis A during the last six months in 2019 in Derna city. This indicates that hepatitis A outbreak in Derna city may not pose a great danger to society as a result of the recovery of those infected with this vital infection. This optimism does not prevent the fact that this virus can take a distant curve and may be fatal. It caused death when this epidemic disease spread in different places from the world especially in elderly (WHO, 2019).

Face-To-Face Survey Study

Face-to-face interview provides comprehensive explanations to allow participants to answer the questions correctly (Schroder 2016). In the present study, the survey was performed in Derna city during the period of 75 days. A total of 464 cases were positively diagnosed with hepatitis A virus during the period from 26th June to 11th September 2019. Among 464 patients, only 208 peoples diagnosed with hepatitis A agreed to interview and answer questions related to the spread of hepatitis A virus in Derna city.

The face-to-face survey was conducted in the homes of those infected with hepatitis A virus, with their families. Among 208 cases who were interviewed, 184 cases were positively IgM (new incidence), while 24 cases were positively IgG (old incidence). One of the important findings which became clear to us through this survey study, that there is the unifying factor between all 208 patients who were interviewed. The unifying factor was that the patients drank water contaminated with sewage. The present survey showed that 70% of patients ate meals from popular fast food restaurants. While 30% of patients ate vegetables and fruits coming from Egypt and irrigated with sewage water (Figure 4).

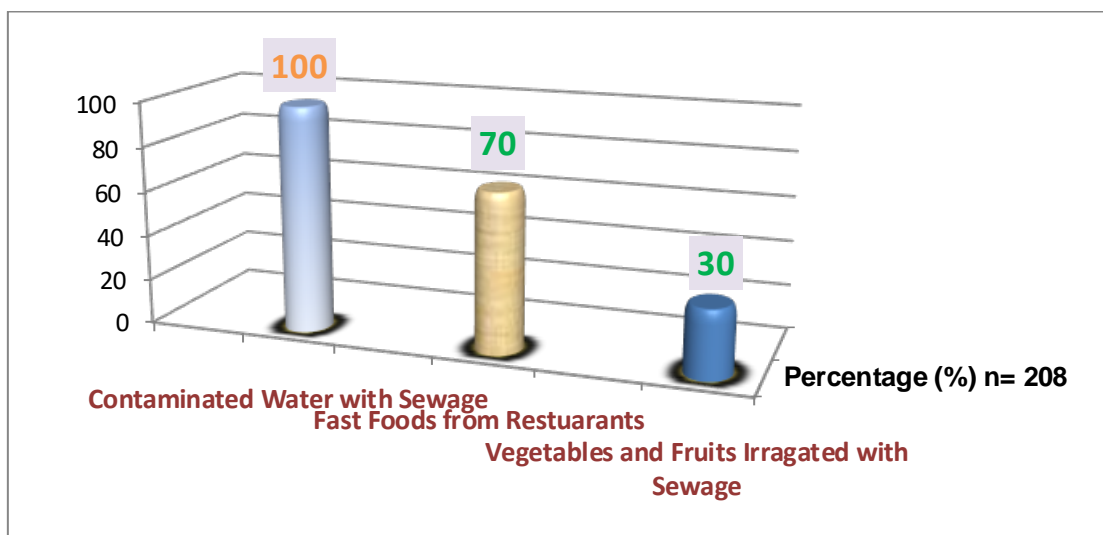


Figure 4. Some Reasons of Hepatitis A Outbreak in Derna from 26th June to 11th September, 2019

Hepatitis A and Suitable Nutrition

The dietary program for patients diagnosed with hepatitis A should contain the following: an abundance of fruits and vegetables, whole grains including oats, brown rice, and barley, lean protein including fish, skinless chicken, egg whites, and beans, low-fat or non-fat dairy products and healthy lipids including nuts, avocados, and olive oil. On other hand, some foods may cause liver damage including : high-calorie such as greasy, fatty, and sugary foods, saturated fats including butter, cream, fatty cuts of meat, and fried foods, and sugary treats including cookies, cake, soda, packaged baked goods, salty foods as well as alcohol and smoking (WHO 2019; American Liver Foundation 2005; Krause's 2000; Heerden 2001, Thompson 2010; Yasutake et al 2012).

Patients diagnosed with hepatitis A should follow the most important tips to protect them from this an epidemic disease. There are important tips include the following (WHO 2019; American Liver Foundation 2005; Krause's 2000; Heerden 2001):

- Take the prescription medicines and hospitalization is necessary in the presence of acute liver failure.
- Need to meet dietician to have a healthy diet plan.
- Get a lot of rest and stay home (no school or work).
- Clean their hands each time when they use the toilet or change a diaper.
- Consume small meals to replace fluids lost from vomiting and diarrhea.
- Eat fat-free or low-fat foods such as peeled fresh fruits and vegetables, fresh juices, fat-free milk and yoghurt, honey and, low-fat ice cream, vegetables soup, dry homemade crackers for patient suffers so ill and refuses to eat.
- Avoid alcohol, smoking, and all sexual activity as well as, stop preparing food for others.
- Stay away from mental stress, negative thinking, and depression and wake up and sleep early.
- Drink an electrolyte mixture for patients with repeated vomiting and diarrhea to keep patients liquid intake. In serious cases, the patient may have to be put on a drip to replenish body water and electrolytes.
- Keep house clean, cool with fresh air and wear loose clothes, and skip very hot baths and showers, as well as drink a lot of water for patients have itching.
- Proper disposal of sewage within communities.

Hepatitis A and Prevention

There are important tips include the following (WHO, 2019; American Liver Foundation 2005; Krause's 2000; Heerden 2001; Thompson 2010, Fiore 2004):

Country Prevention

- Providing physically powerful maintenance of wastewater to prevent its penetration into ground water.
- Preparing a concrete plan to determine the source of hepatitis A infection.
- Preparing a solid plan for garbage disposal and prevent burning garbage near housing areas and food handling regions.

- Improving the organizations that check sanitation, food safety and immunization.
- Providing sufficient supplies of safe drinking water.
- Providing Hepatitis A vaccine in the communities.
- Providing the financial support to the dieticians so the patient should have referred to a dietician for evaluating special diet.

Prevention as Personal Hygiene Practices

- Individuals should clean his/her hands with soap and warm water before and after cooking, after using the bathroom, and after changing diapers.
- Individuals should wash fruits and vegetables thoroughly before eating and keep away from consuming raw or undercooked meat and fish.
- Patients Avoid preparing food for others while they are actively infected.
- Cleaning the patient's waste with disinfectants (Fiore 2004).

Libyan National Disease Control and Prevention

- Communicating with public health officials with detailed cases to providing rapid technical assistance.
- Collecting data reported on assured cases and evaluating and monitoring these data from a national perspective.
- Testing clinical specimens from suspected hepatitis A persons when requested by medical centers.
- Replying questions related to molecular and serologic laboratory testing.
- Providing data to public and healthcare providers through a variety of media (NCDC, 2021).

Conclusion

People's health is precious, which requires the need to find solutions to hepatitis A outbreak crisis. The emergence of concern about this epidemic disease may be related to its ability to continue and spread in neighboring cities. The real fear that hepatitis A will constitute a major burden on health sector of Libya.

About, 959 positive cases of hepatitis A were reported during the last six months in 2019, in Derna city. Males are almost 18.5% more likely than females to be susceptible to infection with hepatitis A virus. One of the important finding in this work showed that the great infection with hepatitis A virus was in Al-Sahel Al-Shargi with a percentage of 38.8% (64 Cases). The unifying factor between all interviewed patients was drinking water contaminated with sewage.

Libyan society should accept the vital role of suitable nutrition in maintaining human health and protecting from epidemic hepatitis A.

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Impact of Low-Dose Oral Sildenafil on Erectile Function As Penile Rehabilitation Protocol After Nerve Sparing Radical Cystectomy in Zagazig University Hospitals

(Original Research Article)

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Abstract

Bladder cancer is very common cancer and Radical cystoprostatectomy is the treatment of choice for muscle invasive bladder cancer and in non-muscle invasive, About 90% of the males complain if ED post nerve sparing radical cystectomy The study included 25 potent and sexually active males with organ confined bladder cancer who were treated with radical cystectomy and urinary diversion. and we follow the patients with Doppler penile us and international index of erectile function and our results shows that no significant deterioration of arterial mechanism postoperatively over preoperative evaluation in both surgical groups $p =$ or more than 0.05. In our study spontaneous progressive return of erectile function over the following months among patients receive sildenafil occurred better than the control group. We find that The recoverability of erectile capacity in post- radical cystoprostatectomy patients is the most part identified with change in veno-occlusive mechanism and the use of low dose oral sildenafil is very beneficial in restoration of erectile function after major nerve sprain pelvic surgery.

Keywords: Urinary Bladder Cancer, Nerve Sparing Surgery, Erectile Dysfunction, Penile Rehabilitation, Oral Sildenafil.

Introduction

Bladder cancer is 9th cancer worldwide and 4th cancer in males of America (ferlay et al., 2014). Bladder cancer is very common in Egypt with incidence rate 4.87 (Stacey et al. 2009).

Radical cystoprostatectomy is the treatment of choice for muscle invasive bladder cancer and in non-muscle invasive (stenzl, et al. 2012).

About 90% of the males complain of ED post nerve sparing radical cystectomy. *Matsuda et al., 2003* Recovery of erectile function post nerve sparing radical cystectomy between 14-18% Walsh P.C. Donker P.J. 1982. The study included 25 potent and sexually active males with organ confined bladder cancer who were treated with radical cystectomy and urinary diversion.

In reconstructive surgery nerve recovery happens at rate of 1-3 mm/d, contingent upon the patient age and other fundamentally local factors (nikovic et al. 2003). In spite of fastidious safeguarding amid radical cystectomy and prostatectomy, with cautious intraoperative mapping of enormous nerves within the pelvis, recuperation of strength if adequate by any means may take as long as 24 months (klotz L et al. 2004).

Materials and Methods

This single blind prospective study was performed between May 2016 and March 2017 in Zagazig University hospitals. The study included 25 potent and sexually active males with organ confined bladder cancer that was treated with radical cystectomy and urinary diversion.

All patients included in the study fulfilled the following criteria:

- *Patients were married*
- *Tumor were confined to bladder and away from bladder neck urethra and prostate were free from carcinoma*
- *Urethra and prostate were free of neurological and penile disease*
- *Patients were fit for anesthesia.*
- *Basal preoperative erectile function was assessed by international index of erectile function and penile Doppler us*
- *After two months of surgery, 25 patients divided into two groups*

- *Group A 12 patients which receive low dose oral sildenafil regularly for 6months*

Group B control group given placebo once daily for 6months and we follow up our patients regularly at 5th and 8th months regarding: IIEF (INTERNATIONAL INDEX OF ERECTILE FUNCTION) SCOR AND PENILE Doppler us (PDU).

Results and Discussion

EF over the following months among group B patient happened .This may have been due to the "neuropria" wonder a brief shortfall of the cavernosal nerves but these unconstrained changes was not as much as low dosage sildenafil heled change and this clarification runs parallel with consequences of trial study done by moreover, low oxygen strain in cavernosal tissue because of hypoxia following surgery prompts vasoconstriction, lead to fibrosis and subsequent ED.

Table (1). The Comparison between Group A and B as Regard erectile Function y LIFE.

Erectile function evaluation	Group A (N=12)	Group B (N=13)	Test	p-value (sig)
IIEF Baseline	19.75 ± 2.45	20.15 ± 1.95	-0.457	0.652(NS)
2 months	7.42 ± 0.99	5.92 ± 1.03	-2.970	0.003 (S)
5 months	10.92 ± 1.37	8.15 ± 1.14	-3.750	<0.001(HS)
8 months	15.58 ± 1.44	11.46 ± 1.26	7.606	<0.001 (HS)
Test p-value (sig)	328.162 ^{ff} <0.001 (HS)	39.000 [‡] <0.001 (HS)		

Table (2). The Comparison between Group A and Group B as Regard Penile Doppler Ultrasound (PDU).

(PDU)	Group A (N=12)	Group B (N=13)	Test	p-value (sig)
PSV (cm/sec) Baseline	48.66 ± 6.15	49.76 ± 4.98	-0.494	0.626(NS)
2 months	45 ± 8,67	45.15 ± 7.70	-0.047	0.963 (NS)
5 months	47.08 ± 8.30	44.85 ± 7.52	0.707	0.487(NS)
8 months	49.17 ± 8.60	46.69 ± 6.89	0.797	0.434(NS)
Test p-value (sig)	7.659 ^{ff} 0.001 (S)	7.202 [‡] 0.007 (S)		

In the present study the penile Doppler did not show significant deterioration of arterial mechanism postoperatively over preoperative evaluation in both surgical groups p = or more than 0.05. In our study spontaneous progressive return of erectile function over

the following months among patients receives sildenafil occurred better than the control group. Additionally, the recoverability of erectile capacity in post- radical cystoprostatectomy patients is the most part identified with change in veno-occlusive mechanism.

This implied that veno-occlusive instrument was better and dynamically returned close to ordinary in the gathering on subjective and target bases within 8 mo of take after up. Moreover, the NS radical cystectomy strategy taken after by low measurements oral sildenafil can guarantee great sexual result "in light of the short follow-up period), in this way, every endeavor ought to be made to safeguard the neurovascular package amid Cystoprostatectomy ". The present study found that utilization of subjective and objective devices in evaluation of the patient is advised and indisputable.

Conclusion

The recoverability of erectile capacity in post- radical cystoprostatectomy patients represents the majority part identified with modify in veno-occlusive mechanism. Also, the veno-occlusive instrument was superior and dynamically returned close to ordinary in the gathering an on subjective and target bases within 8 mo of take after up. This study concludes that use of subjective and objective devices in assessment of the patient is recommended and indisputable. A randomized clinical review utilizing solitary kind of preoccupation over a substantial group of patients for long haul follow-up ought to be done to affirm our conclusion.

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Conflict of interest:

Authors declare no conflict of interest in the present research study

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Prevalence of appendectomy at Alwahda hospital in city of Derna, Libya. Cross-sectional survey.

(Original Research Article)

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Abstract

Background: Acute appendicitis (AA) is a major common disease that need urgent surgical treatment. Appendectomy is the right choice treatment for AA. The aim of our study was to assess the prevalence of acute appendicitis and the associated risk factors at Alwahda hospital patients in Derna city, Libya.

Material and Methods: This is a cross sectional study. All patients who attend to general surgery department at Alwahda hospital and undergoing to surgical operations with different reasons from December 2020 to December 2021 were included in this study. Demographic and clinical data on patient's age, sex, and symptoms were collected.

Result: Out of 403 patients were underwent general surgery at Alwahda hospital in period of the study. The most common reasons for surgery were GBS 116 (28.7%), appendectomy 96 (23.8%) and Brest surgery 46(11.4%). Out of 96 patients with suspect acute appendicitis, 36(37.5%) were males and 60(62.5%) were females. The incidence of AA most occurs in patients with age groups between 11-20 year 51 (53.1%) and age groups 3-10 years 32(33.3%), respectively. Most common clinical findings were abdominal pain 94(97.9%), vomiting86 (89.6%), and fever 52(54.2%). Positive Ultrasound report was 33 (34.4%), and complications of appendicitis were (19.8%). Negative rate of appendectomy was (16.6%).

Conclusion: The study shows high Prevalence rate of acute appendicitis in younger

patients with high incidence of complications, which lead us to have deep thinking in way that will help in early diagnosis of acute appendicitis and to reduce the complications and negative rate of appendectomy.

Keywords: Appendectomy, appendicitis, incidence rate, Libya.

Introduction

Acute appendicitis (AA) is major common diseases that need urgent surgical treatment [1]. Appendectomy is the right choice treatment for AA [2]. Early diagnosis of AA will increase the success rate of appendectomy and will reduce the development of complications such as peritonitis, perforation and gangrene [3,4]. These complications may expose the patients for life threatening situations. Several laboratory and images studies have shown that uses of some serum inflammatory markers such as C-reactive protein and White blood cell count and uses of ultrasonography and CT scan images may have an advantage in accuracy diagnosis of AA and so reducing the related complication and safe the patient's life [5-9]. Clinical assessments of patients still the more reliable method in diagnosis of AA. Multiples scoring system have been reported in establishing of diagnosis of AA. Alvarado scoring system considered one of the most common scoring systems that have been widely used and it depend mainly on the physical examination and some laboratory investigations [10-12]. However, the definitive diagnosis for AA can only be confirmed by histopathology examination after appendectomy. 250,000 cases of acute appendicitis were annually reported in United States of America [13]. Brunicardi F C et al (2012), he reported that the prevalence of a cute appendicitis during lifetime is approximately 7% [14]. Another study by Rothrock SG et al (2000), shown that acute appendicitis is a more common occur in childhood and approximately 1-8% of children with acute abdominal pain requiring appendectomy [15]. Prevalence of acute appendicitis is worldwide difference and range from 4.9% to 8.6%. [16]. The incidence of acute appendicitis is more likely occur in age group 15-24years, however, it is reported that 5% of old people (over 60 years) may expose to AA [17]. Data on prevalence of acute appendicitis in Libya are very few. Our objective for this study was to assess the prevalence of acute appendicitis in Derna city and to determine some risk factors that may help in diagnosis and management of acute appendicitis.

Materials and Methods

This is a cross sectional study was conducted at Alwahda hospital located in Derna city, Libya from December 2020 to December 2021. All patients who attend to general surgery department at Alwahda hospital and undergoing to surgical operations with different reasons were included in this study. Only war cases were excluded from this study, as it is not usually daily work. The ethical committee of Alwahda Hospital approved the study protocol. Informed consent was taken from all participants' patients and family for child patients.

Inclusion criteria:

- 1-All patient who attend to general surgery department at Alwahda hospital and undergoing to surgical operation with different reason were including in this study.
- 2-Race: all races and ethnicities are eligible for study enrollment.
- 3-Gender: males and females offered to participate in this study.

Exclusion criteria: only war cases were excluded from this study

Sample size: All patients with inclusion criteria who underwent surgical operation at Alwahda hospital through the study period were included.

Study protocol: All data including the demographic information, history, physical examination, and laboratory data such as leukocytosis, ultrasound and histopathological reports gathered from the all-participants' files.

Statistical analysis: We made our statistical analysis by using The Statistical Package for social Sciences; SPSS version 22.0 (SPSS Inc., Chicago, IL) and descriptive results are presented as mean \pm standard deviation in tables. Appropriate tests were used at p value ≤ 0.05 .

Result: Out of 403 patients were underwent general surgery at Alwahda hospital in period of the study. The most common reasons were GBS 116 (28.7%), appendectomy 96 (23.8%) and Brest surgery 46(11.4%).

Characteristic of patients with suspected acute appendicitis (N=96)

The mean age of our sample was 14.04 years with SD ± 8.11 (range of age was 3-50 years). It shows that the age was significant difference between both genders with p-value 0.02 using T-test (mean age for male 11.7 years with SD ± 5.8 and for female 8.9 with SD ± 8.95). Out of 96 [60 (62.5%) females and 36 (37.5%) males], patients with lower right abdominal pain underwent an operation for suspected appendicitis (appendectomy). 16 (16.7%) had a diagnosis on opening surgery with a normal appendix, 59 (61.5%) had acute appendicitis, 12 (12.5%) had gangrene, and 9 (9.4%) had perforated appendicitis, figure (1). All patients who underwent surgery were discharged home. The most common age group for the patient was 11-20 years (53.1%) followed by age group 3-10 years (33.3%), where female patients consisted most of affected gender 63.3% (table 1).

Table (1): age group related to the gender

Age group by years	Male (%)	Female (%)	Total (%)
3-10	19 (52.8%)	13 (21.7%)	32 (33.3%)
11-20	13 (36.1%)	38 (63.3%)	51 (53.1%)
21-30	4 (11.1%)	5 (8.3%)	9 (9.3%)
31-50	0	4 (6.7%)	4 (4.1%)
Total	36	60	96

Complications of appendicitis: As shown in tables (2,3,4). They showed that the rate of complication was (21.8%) and male patients have more likely to report complication than female patients (Odds ratio (OR)=1.1). Also, they showed that most common complications were gangrene and perforated (57.1%, and 42.8%), respectively. Children patients within age group 3-10 years (57.1%) were more likely to report complications. Moreover, it was seen that the complications most occur in patients who had Alvarado score between 6 to 7 score.

Table (2). Compilations related to gender

Complications	Male (%)	Female (%)	Total (%)
Gangrene	7 (19.4%)	5 (8.3%)	12 (57.1%)
Perforated	5 (13.9%)	4 (6.7%)	9 (42.8%)
Total	12 (57.1%)	9 (42.8%)	21

Table (3). Compilations related to age

Age group by years	Gangrene (%)	Perforated (%)	Total (%)
3-10	6 (50%)	6 (66.7%)	12 (57.1%)
11-20	3 (25%)	2 (22.2%)	5 (23.8%)
21-30	1 (8.3%)	0	1 (4.7%)
31-50	2 (16.7%)	1 (11.1%)	3 (14.2%)
Total	12	9	21

Table (4). Compilations related to Alvarado score.

Alvarado score	Appendicitis		Complications	
	Yes	NO	Gangrene	Perforated
3	4	2	0	0
4	16	3	0	0
5	2	3	0	0
6	19	6	3	3
7	39	2	9	6
Total	80	16	12	9

Negative rate of appendectomy: As shown in Table 5. It showed that negative rate of appendectomy was (16.6%). Females' patient more likely to have negative rate of appendectomy than male patients, odd ratio (OR=3.0).

Table (5). Negative appendectomy rate related to the gender

Appendicitis	Male (%)	Female (%)	Total (%)
Present	33 (91.7%)	47 (78.3%)	80 (83.3%)
Normal	3 (8.3%)	13 (21.7%)	16(16.6%)
Total	36 (37.5%)	60 (62.5%)	96

Clinical and Laboratory finding: As shown in table 6.It showed that right lower quadrant tenderness, vomiting and anorexia are the most common clinical finding in patient with suspected acute appendicitis (94(97.9%); 86(89.6%); and 82(85.4%), respectively. Also, it noticed that raised White Blood cell (WBC) and C-reactive protein (CRP) were seen in most of patients (68.3%; 72.9%), respectively

Table (6). Clinical and laboratory parameter

Clinical and Laboratory parameter	Patients (N=%)
Migratory pain	69(71.9%)
Nausea and or vomiting	86(89.6%)
Fever> 38 °C	52(54.2%)
Anorexia	82(85.4%)
Right lower quadrant tenderness	94(97.9%)
Rebound tenderness	67(69.8%)
WBC > 10,000/ml	66(68.3%)
CRP ≥1.17 mg/dL	70(72.9%)

Ultrasound Result: As shown in Table 7. It showed that positive ultrasound result was seen in only one third of patients with suspected appendicitis (34.4%) and the other third with suspicious acute appendicitis (29.2%).

Table (7). Ultrasound result.

Ultrasound report	Patients (N=%)
Positive acute appendicitis (AA)	33(34.4%)
Negative AA	35(36.5%)
Suspicious AA	28(29.2%)
Total	96

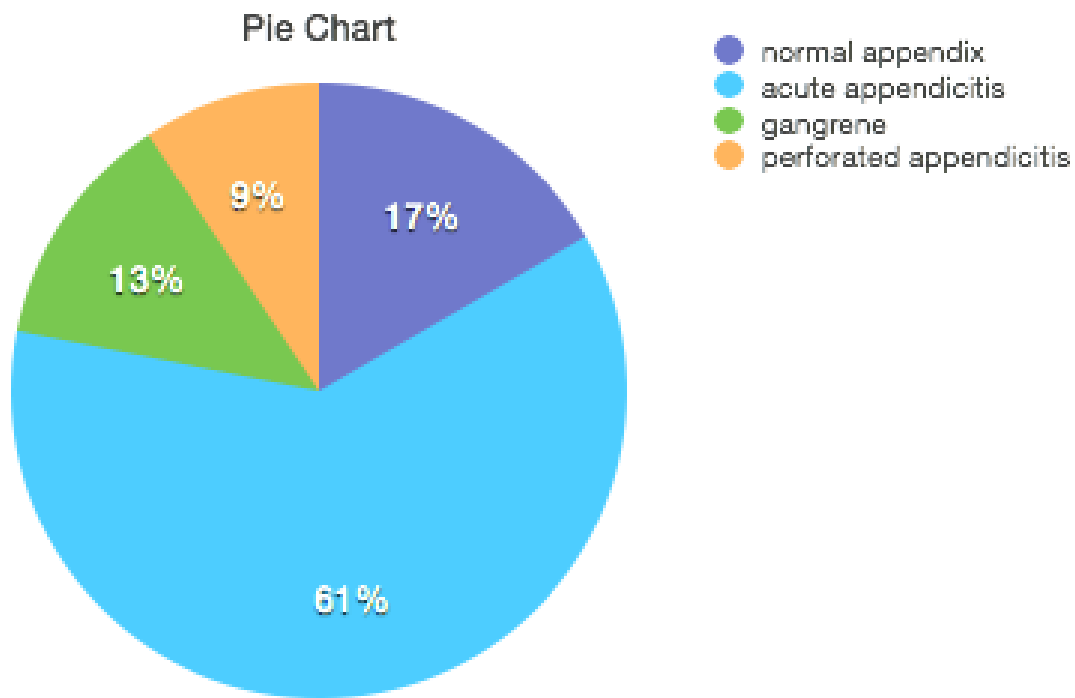


Figure (1).

Discussion:

Appendectomy is treatment of choice for patients with appendicitis. However, confirmed diagnosis of acute appendicitis is only made through histopathology examination for specimens. Prevalence of appendectomy consist one of the most common emergence cases that need urgent surgical interventions. In our study prevalence of Appendectomy consist the second reason for surgical intervention at our hospital with high predominate rate in female patients than male and this finding have an agreement with other study done by Parisa Javidi et al (2013) which showed that

female patients were more likely to have appendectomy than male patients (18). On The other hands, Chaudhar YP et al (2015), reported that male patients had higher tendency rate to have AA than female patients (19). In our study, children were more likely to have acute appendicitis than adult and this finding was in agreement with other study done by K. Suresh Babu et al, 2017(20). Our negative rate of appendectomy was (16.6%) and this rate was accepted in compared with other study done by Parisa Javidi et al (2013), which showed higher negative rate of appendectomy (23.4%). Also, reported Perforated and gangrene appendicitis in our study were same as in the other study done by Sevgi Buyukbese et al 2016(21). The mortality rate in our study was Zero.

Conclusion:

The study shows high Prevalence rate of acute appendicitis in younger patients with high incidence of complications, which lead us to have deep thinking in way that will help in early diagnosis of acute appendicitis and to reduce the complications and negative rate of appendectomy.

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Prevalence of Vitiligo in the Tobruk District, Libya

(Original Research Article)

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Abstract

Vitiligo, a common depigmenting skin disorder, has an estimated prevalence of 0.5–2% of the population worldwide. The disease is characterized by the selective loss of melanocytes which results in typical non scaly, chalky-white macules. In recent years, considerable progress has been made in our understanding of the pathogenesis of vitiligo which is now clearly classified as an autoimmune disease. Vitiligo is often dismissed as a cosmetic problem, although its effects can be psychologically devastating, often with a considerable burden on daily life. In 2011, an international consensus classified segmental vitiligo separately from all other forms of vitiligo, and the term vitiligo was defined to designate all forms of nonsegmental vitiligo. The current research data-based work was aimed to illustrate the differences in vitiligo types of distribution in a specific region (Tobruk region), in addition to determine the effect of the gender, age, family history and presence of other autoimmune disease in the pathogenesis of the disease as well as the treatment protocol. The data showed that non-segmental vitiligo was observed in more cases than segmental vitiligo, in contrast, gender differences showed no difference in the distribution of the vitiligo types whether segmental or non-segmental. Segmental vitiligo was more common in children while non-segmental cases were more in adults. Patients with vitiligo have some psychological issues and the treatment protocol should involve both topical and systemic medicaments. More studies should be conducted to evaluate the reasons why treatment protocols vary between patients and in some cases, patients do not adhere to the medicaments due to the long period of treatment.

Key Words: Autoimmune, Focal, Non-segmental, Segmental, Vitiligo.

Introduction

Vitiligo is a common acquired chronic DE pigmented disorder of the skin leading to development of white macules or patches due to selective destruction of functioning melanocyte in skin, hair, or both (Ezzedine K et al 2015). Other than the skin and skin appendages of domesticated mammals, melanocytes are found in the oral mucosa, eye, cochlea and less consistently the meninges (Pandiani C et al 2017). The disorder now known as Vitiligo was first described by (Claude Nicolas Le Cat 1765). Vitiligo can be segmental or non-segmental depending upon the morphology of the clinical involvement (Ezzedine, K et al 2012). It can be classified as progressing or stable based on the activity of the disease. Further, the extent of involvement can be limited (localized disease) or extensive (generalized disease) (Passeron, T 2017). We are probably living in the most exciting period for the understanding and treatment of the disease in recent years. Several advances have been made, with better comprehension of the role of the skin in its entirety with involvement of cells other than melanocytes, the importance of intrinsic metabolic abnormalities in initiating the immune response, the role of the immune system, especially memory T cells, and non-immunological factors with particular interest in the role of keratinocytes and fibroblasts (Passeron, T 2020; Rosmarin, D et al 2020). The commonest form, Non-segmental vitiligo (NSV), shows symmetrical depigmentation of the body. Contrary, segmental vitiligo (SV) is less common ($\pm 10\%$) and is characterized by a unilateral distribution. In addition, NSV shows an unpredictable disease course, whereas SV typically stabilizes a few months after onset. Altogether, this suggests that distinct pathophysiology pathways might be involved, which could clarify the differences in clinical presentation and disease course (R. Speeckaert et al 2020). Currently, it is well demonstrated that the depigmentation process is linked to an immune destruction of melanocytes. Based on these data new treatments are under development (McKesey J and Pandya AG 2019; Joshipura D 2018). However, most favored hypothesis is autoimmune because vitiligo is frequently associated with other disorders, which have an autoimmune origin such as Autoimmune Thyroid Disease (AITD) and Diabetes Mellitus (DM) alopecia areata pernicious anaemia. Recent studies suggest that vitiligo is not just a cutaneous disorder (Sadeep M. S et al 2017). Vitiligo is a polygenic disorder and many genes related to autoimmunity are associated with its pathogenesis (Huraib, G.B et al 2020). Vitiligo occurring in melanoma patients, with or without treatment, is called melanoma-associated vitiligo (Ramondetta A et al 2020).

The present research study was aimed to investigate the impacts of common factors on the vitiligo status in a Tobruk city – Libya populations. Furthermore, the distribution of the types of vitiligo in the same population taking into consideration the factors namely age, gender, family history and an autoimmune disease (AIDs).

Material and Methods

A total of 102 patients' demographic data were collected at Al-Turyak clinic in Tobruk. The sample population covered a wide range of categories and disease severity. Patients' history of vitiligo, treatments approaches over the years were also recorded to assess the impact of the different treatments protocols to improve the patient's life quality. University of Tobruk ethics committee approval was obtained 04/221229. The study was conducted in accordance with good clinical practice and the declaration of Libyan Research Council. The collected data were recorded into Microsoft excel 2013 and the significant difference between different patient's categories were determined using DATA analysis function in Excel in addition to Tuckey test on SPSS.

Results

The complete data in the current study (102 pts) were collected at Al-Turyak clinic in Tobruk City during period from 1-6-2020 until 30-6-2021. The vitiligo types of the total patients were expressed generally as NSV, SV and focal vitiligo (FV) 51, 46 and 5 respectively (Figure 1). A distribution of SV and NSV among a gender group was founded as the female patients were 52 whereas the male patients were 50 (Figure 2). The prevalence of vitiligo types in children was presented as that SV is 33 patients, FV is 4 and NSV is only a single patient (Figure 3). It is clear seen that only 50 patients were affected as 39 of NSV, 10 of SV and a patient of FV according to the correlation between a family history to SV and NSV (Figure 4). The correlation among other autoimmune diseases (DM, THYR and DM&THYR) was demonstrated with respect to both SV and NSV. It was obvious that the affected patients by DM were higher in case of NSV (18pts) compared to SV (14pts). On other side for THYR, the affected patients were at the same rate of 3 and finally there was no patient affected by DM&THYR in case of SV while 13 patients affecting in case of NSV (Figure 5). Different treatment protocols for both SV and NSV was applied and noted that only 55 patients experienced therapy by local medicaments whereas 41 patients used local and systemic drugs and also indicated that 4 patients submitted to local, systemic

therapy and medical imaging while only 2 patients were subjected to a complete dipping (Figure 6).

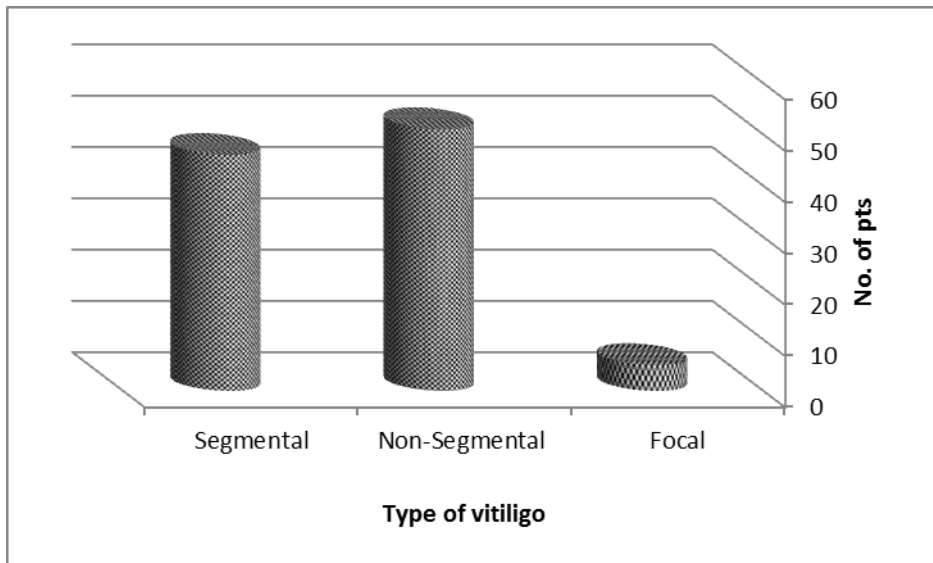


Figure1: General distribution of vitiligo types.

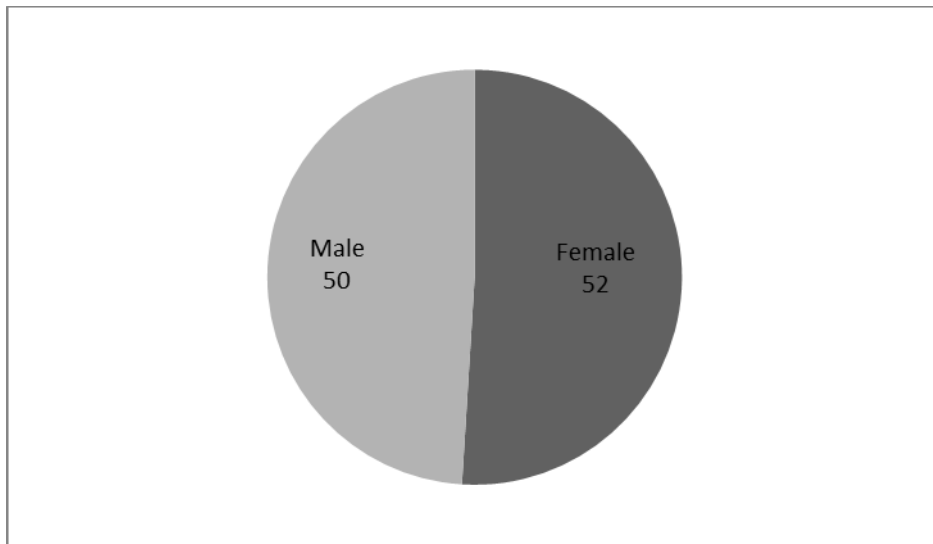


Figure 2: Distribution of SV and NSV among a gender group.

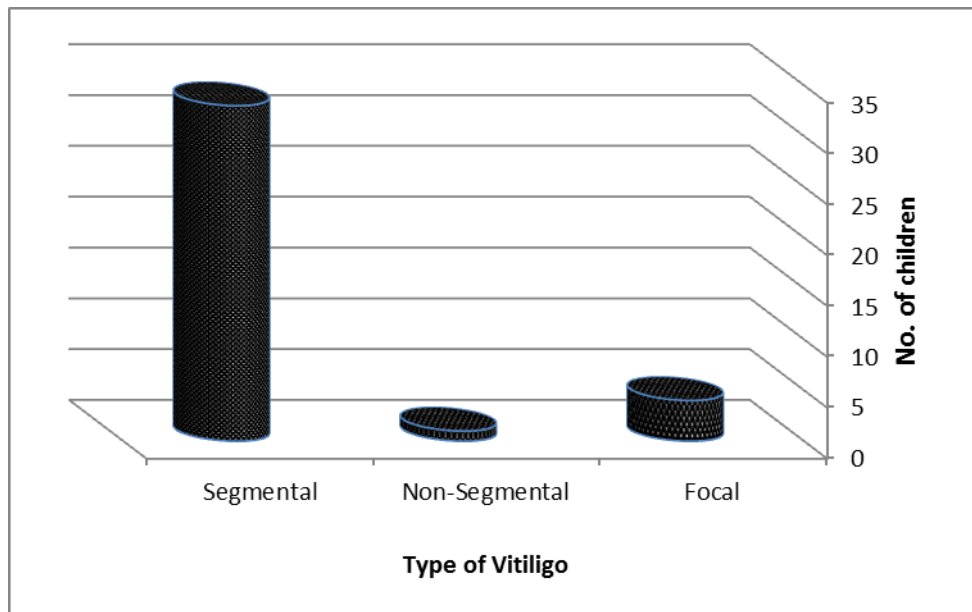


Figure 3: Prevalence of SV and NSV in children.

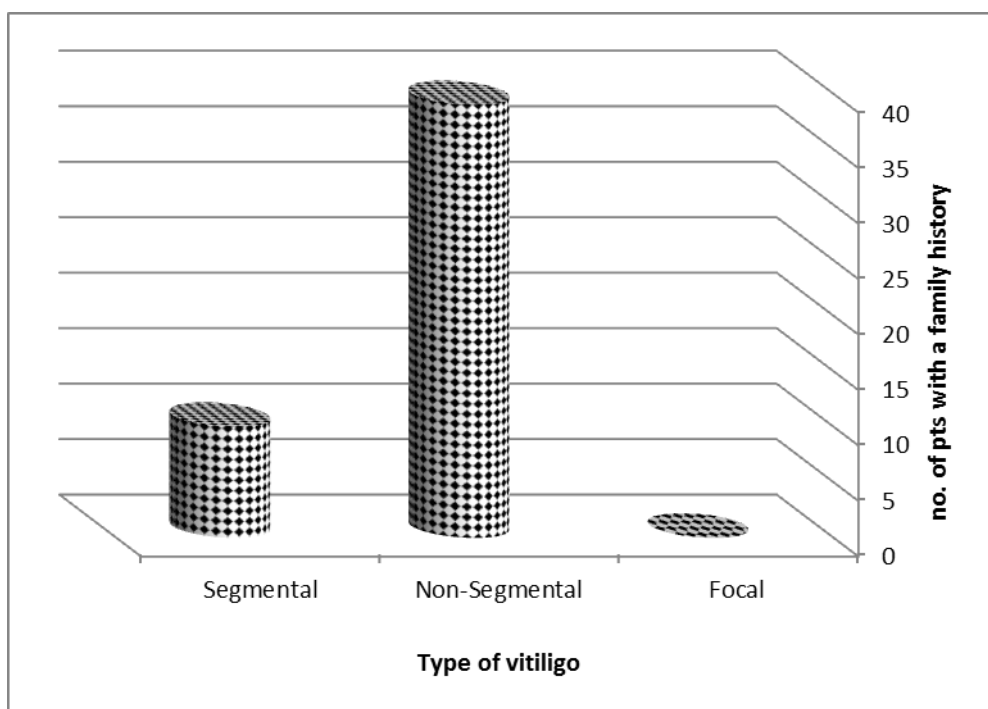


Figure 4: Correlation between a family history to SV and NSV.

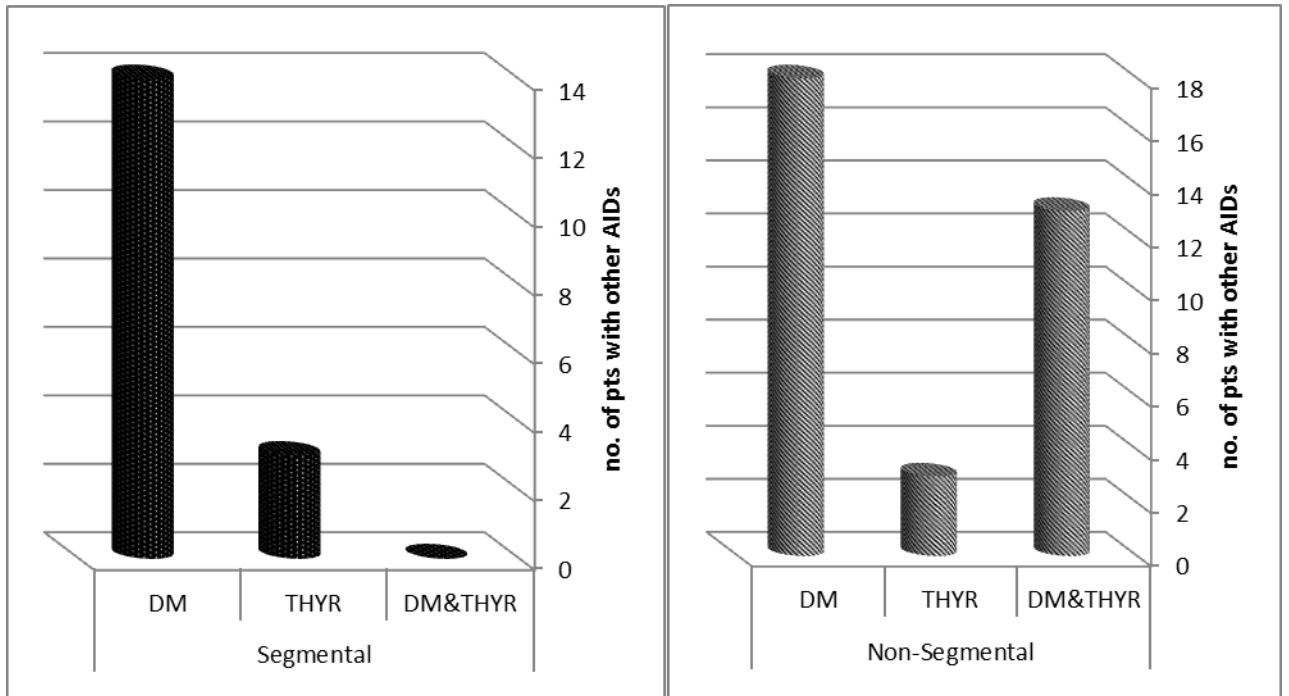


Figure 5: Correlation between the presence of AIDs and the type of Vitiligo in the population.

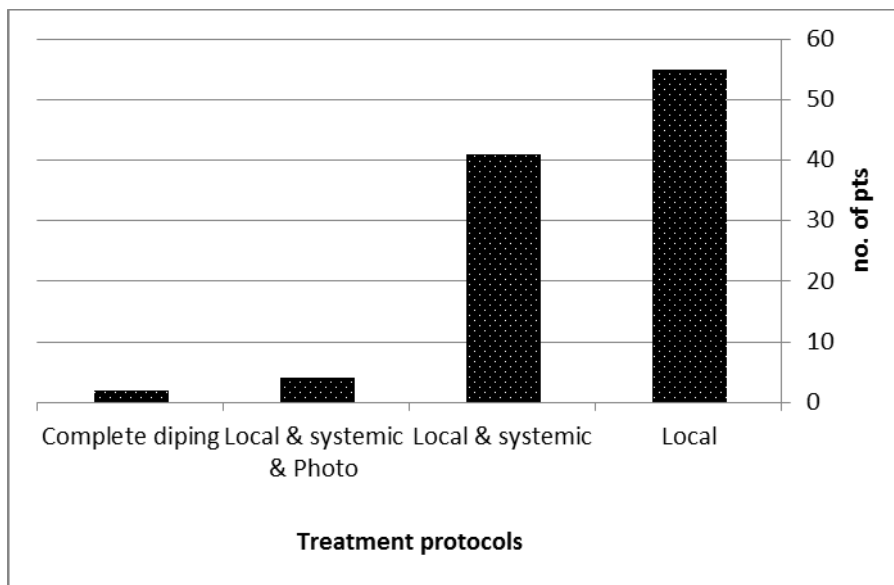


Figure 6: Different treatment protocols for both SV and NSV.

Discussion

The data generated showed interesting findings, the approach used in the current study design was efficient in determining the main parameters to have a clear insight on the differences in vitiligo types among the population of Tobruk district. The vitiligo is characterized into main two types of SV and NSV, the results showed that NSV is

significantly ($p < 0.05$) more common 50% than SV (45%) and FV (5%), suggesting that the difference in the age or the presence of other AIDs might cause the difference in the disease types of distribution. On the other hand, the distribution of the disease among the population was marginally different between female (49.1%) and male (50.9) cases. The results are in line with the literature that SV is more common in children; the data presented a significant difference ($p < 0.05$) between SV and other types of vitiligo in children. The present of other AID might be the reason for some patients to develop a vitiligo of lengthens the treatment protocol, patient with AID namely DM, thyroid, or the combination of both were recorded. The data showed that NSV is significantly ($p < 0.05$) more common in patients with other autoimmune disorders when compared to SV. Additionally, NSV will be more common in patients with family history (79%) when compared to (20%) with SN.

Conclusion

The current research study gave an understanding into the prevalence of the distribution of the vitiligo between the patients in the district of Tobruk. Patients were having more NSV when compared to those who have SV. Gender plays no role in the prevalence of the disease as the cases occur equally in both male and female, while the age difference was one of the factors as more children have SV and adults' group have a dominant NSV. More chance of having NSV if the patient has a disease history. To sum up, among all the factors age and family history impact on the distribution of the vitiligo between the population, while gender showed no impact on the prevalence of the disease. Treatment of vitiligo is a long process and the time required varies among a patient.

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Type 1 Diabetes and Associated Autoimmune Diseases (Celiac, Autoimmune Thyroid, Vitiligo)

(Original Research Article)

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Abstract

Diabetes mellitus is a common autoimmune endocrine disorder associated with organ-specific autoantibodies which are frequently detected at the time of diagnosis. Individuals with type 1 diabetes have increased prevalence of other autoimmune diseases including autoimmune thyroid disease, celiac disease, and primary adrenal failure. In some patients, a shared genetic susceptibility for these diseases has been demonstrated. To define the prevalence of autoimmune disease in Libyan patients with type 1 diabetes mellitus (T1DM). Blood samples were collected from 99 patients with T1DM who are followed by Tobruk Diabetic Center, Libya. The patients were composed of 45 females (45.4%) and 54 males (54.5 %), of the diabetic children 10 patients about 10.1% were positive for celiac disease (female 6 % and 4 male %) confirm with anti-tissue-transglutaminase (TTG), patient with diabetes had significant higher incidence of celiac diseases, also In this study we found 4 patients have autoimmune thyroid disease about (4%) belonged to female sex, vitiligo 2 patients female predominance. From previous result we concluded that the prevalence of autoimmune thyroid diseases, celiac diseases, vitiligo is high in (T1DM) especially among female patients.

Keywords: Celiac diseases - Autoimmune Thyroid Diseases; Type 1 Diabetes.

Introduction

Autoimmune diseases (ADs) comprise a range of chronic diseases in which the immune response to self-antigens results in damage or dysfunction of the target organs. As the pathogenesis of various ADs share common genetic factors and immunologic processes, these diseases often coexist within the same individual and families (1). Among the over 80 different ADs, celiac disease and hypothyroidism are the most frequently observed additional ADs in type 1 diabetes (T1D), followed by gastric autoimmunity (including pernicious anemia), vitiligo, hyperthyroidism, autoimmune adrenalitis, gonadal insufficiency, autoimmune hepatitis, dermatomyositis, and myasthenia gravis (2,3). In general, female sex, older age, and longer duration of diabetes confer a greater risk of multiple ADs (4). There is also genetic overlap between T1D and other ADs outside the HLA region (5). Clustering of ADs in the same individuals and in the same families, however, indicates that shared environmental or other pathophysiological mechanisms cannot be ruled out (6).

Autoimmune thyroiditis

Autoimmune thyroid disease is the condition most commonly associated with Type 1 diabetes, but it is also the least serious and the easiest to treat. It is important to make a clear distinction between hypothyroidism (an under-active thyroid), which is much more common, and hyperthyroidism (an over-active thyroid).

Autoimmune thyroiditis is found in 13 to 23% of people with Type 1 diabetes, and the risk increases with age. According to studies, almost 40% of women may test positive for autoantibodies (used for diagnosis).

Celiac disease

Celiac disease is an autoimmune inflammatory disease of the gut, directly triggered by gluten. A person with Type 1 diabetes is three times more likely to have celiac disease¹. Again, the condition is diagnosed by testing for specific autoantibodies. The classic symptoms include bloating, abdominal pain, diarrhea or constipation, fatigue or anemia.

Vitiligo

In vitiligo, the melanocytes that give the skin its pigment are weakened as a result of autoimmune inflammation, causing discoloration of the skin.

The present study was carried out to give background on autoimmune diseases (Type 1 diabetes, Autoimmune thyroid disease, Celiac disease, Vitiligo).to study effect of these autoimmune diseases on diabetes control and to determine prevalence of these autoimmune diseases among Libyan patient with diabetic in Tobruk city.

Materials and methods

Blood samples were collected from 99 patients with T1DM who are followed by Tobruk Diabetic Center, Libya. The patients were composed of 45 females (45.4%) and 54 males (54.5 %), mean age 10 ± 5 years, mean duration of diabetes 5.7 ± 5.0 years (range 0.1-15years). Patient investigated for celiac and autoimmune thyroiditis, Celiac disease has been diagnosed by finding positive anti- tissue transglutaminase (TTG) test and endomysial antibody (EMAAb) and Autoimmune thyroid disease diagnosed by anti-thyroperoxidase (TPO) and anti-thyroglobulin antibodies (TG). TSH and FT4 concentrations were measured in all subjects.

Ethical considerations

I hereby declare that the clinical research paper titled [Type 1 diabetes and associated autoimmune diseases (celiac, autoimmune thyroid, vitiligo)] has received ethical approval from institutional review board (Tobruk medical center ethic committee) prior to its commencement (Ethical approval number NBC:009.H.23.2) All patients diagnosed with type 1diabetes were informed about the research and gave their verbal consent.

Results

99 patients (54male -45 female) with type 1diabetes mellitus included in this study, with clinical evidence of classical manifestation diabetes mellitus, examination of these patients reveal that the incidence of autoimmune diseases was significantly increased with type 1 diabetes mellitus, compared with normal population. of the diabetic children 10 patients about 10.1% were positive for celiac disease confirm with TTG and endomysial antibody, as having celiac (6 female about 60%, male4

about 40%) ,(Figure 1) reveal that patient with diabetes had significant higher incidence of celiac diseases ,also in Figure2 celiac disease show female predominance, in this study also we found 4 patients of diabetes child have thyroid dysfunction about 4.0% with positive antithyroglobulin antibodies (TG-Ab),all patients female(100%) with hypothyroidism low FT4, this female predominance in the present study is also documented in different reports, We have 2 patients2% vitiligo diagnosis by clinical finding ,2 female patient.

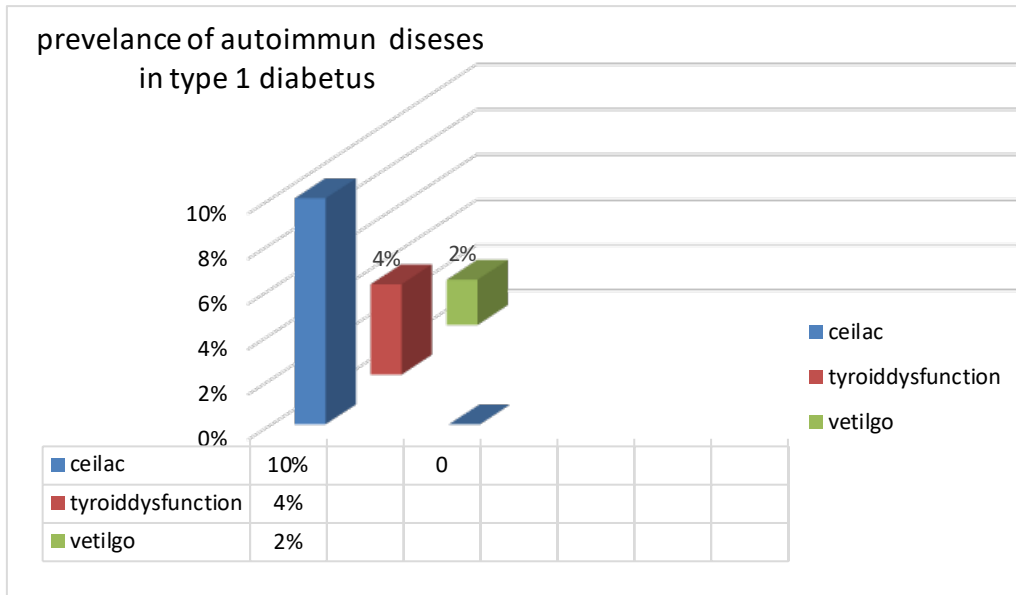


Figure 1: Prevalence of Autoimmune Disease in Type1Diabetes.

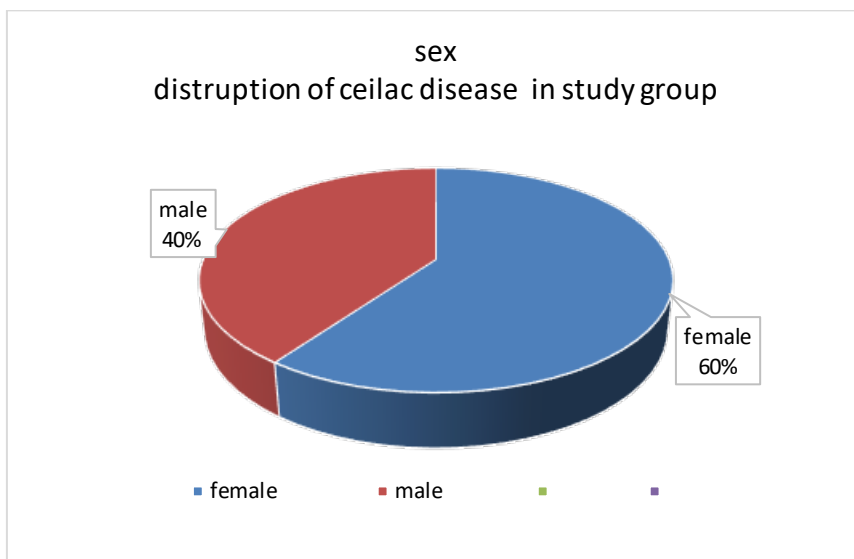


Figure 2: Sex Distribution of Celiac Diseases in Study Group.

Discussion

The aim of this study was to determine the prevalence of autoimmune disease among Libyan patients in TOBRUK city with type 1 diabetes mellitus. The prevalence of these autoimmune disease among patients with type 1 diabetes mellitus is conflicting at present. T1DM is associated with autoimmune thyroid diseases (A I T D), celiac disease, (CD), Addison disease AD, vitiligo, other autoimmune diseases. These diseases can occur together in defined syndrome with distinct pathophysiology and characteristic: autoimmune poly endocrine syndrome I and II (7)

Type 1 diabetes (T1D) is an organ-specific autoimmune disease caused by the autoimmune response against pancreatic β cells. T1D is often complicated with other autoimmune diseases, and anti-islet autoantibodies precede the clinical onset of disease. The most common coexisting organ-specific autoimmune disease in patients with T1D is autoimmune thyroid disease, and its frequency is estimated at > 90% among patients with T1D and autoimmune diseases. Furthermore, patients with anti-thyroid antibodies are 18 times more likely to develop thyroid disease than patients without anti-thyroid antibodies. Therefore, for early detection of autoimmune thyroid disease in children with T1D, measurement of anti-thyroid antibodies and TSH at T1D onset and in yearly intervals after the age of 12 yrs. is recommended. Autoimmune thyroid disease more common in female after the age of 12 years and increased with longer duration of diabetes (8). In our study on 90 patients in regular follow up in Tobruk diabetes center shows that patient with diabetes had significantly higher incidence of autoimmune hypothyroidism (4%) which were more than occurs in normal people.

This is in agreement with Jayaraman et al (9), in study included 214 patient with type 1 diabetes observed 6% patient have hypothyroidism. Several report inconsistent results in contrast with what has been found in this study. Umpierrez et al (10) he found 33% of patient have thyroid dysfunction, more common in female than male. Also, prospective study on 489 patients in Tripoli medical center 28.7% of cases have thyroid dysfunctions more common in the female.

In our study we found 10 patients (10%) with celiac diseases, 6 female (about 60%) average age (3-5 years) and 4 males (40%) average age (7-10 years), have been diagnosed by finding positive anti tissue transglutaminase (TTG) test. The prevalence

of celiac disease with patient of type 1 diabetes is approximately 20 times higher than normal population(11),patients wit out celiac disease were significantly younger at diabetes onset (12). In agreement with our study Ashabani et al(13) investigated 234 Libyan children with T1DM for CD. the prevalence of celiac disease in this study was thus 10.3%. The prevalence of CD in patient of type1 diabetes mellitus in Libya was found higher than in several European countries.

Conclusion

The prevalence of autoimmune disease (thyroid -celiac-vitiligo) in type 1 diabetic patients is higher than in the general population. The high prevalence of these diseases may be explained by shared genetic susceptibility ,the genetic risk for these diseases overlaps and includes the genes within major of histocompatibility complex (MHC) ,for these reason A routine screening strategy should be implemented with the determination of anti-thyroid antibodies and TSH ,TTG antibodies in type 1 diabetic patients, particularly in girls, and in patients with diabetes of more than 5 years duration.

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Effect of Breast Feeding Versus Formula Milk Feeding on the Preterm Infants in the Neonatal Intensive Care Unit at Tobruk Medical Center

(Original Research Article)

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Abstract

The effect of breast feeding versus formula milk feeding on growth and short-term outcomes among preterm infants in Neonatal Intensive Care Unit at Tobruk Medical Center. This is a case control study over 12 months period was conducted on 52 premature babies admitted in the nursery of Tobruk Medical Center from 1stJan. 2019 till 1stJan. 2020. All admitted preterm babies in the study period were enrolled (n=52) and divided according to feeding pattern into three groups (babies on exclusive breast milk(n=10), group on bottle milk (n=18)and third group on bottle and breast milk(mixed) (n=24) .These three feeding patterns were compared in terms of their effects on weight gain, Length of hospital stay (LOS), outcome, incidence rate of feeding intolerance, sepsis and incidence rates of complications. The study included 52 premature newborn ,29 males (55.8%) and 23 females (44.2%) with gestational age (GA) ranging (28-36weeks) and BW ranging (900-3.600 grams) and All newborns were Libyan with maternal age ranging(17-37 yrs.) were the Length of hospital stay LOS ranging (1-55days). The most common reported maternal diseases in this study were Urinary tract infection UTI (15,38%) followed by vaginitis and UTI (7,69%),other diseases (1.92%),but the majority 62% without (1.9%) newborn have distension ,1 (1.9) with gastric residual, 1 (1.9%) have poor sucking .Regarding the complication happen in preterm enrolled in this study 3(5.8%) complicated with anemia , apnea , 2 (3.8%) nosocomial infection , 1 (1.9%) jaundice ,1 (1.9%)

mixed complication ,were 34 (65.4%) not have complication. 92% of enrolled preterm discharged, 2% transferred and 6% died. We found no significant correlation between types of feeding and inflammation risk (C reactive protein CRP marker) .

Key Words: Breast Feeding; Premature; Formula Milk.

Introduction

Exclusive Breastfeeding (EBF) until the sixth month of life recommended by the World Health Organization (WHO) is the ideal food for promoting healthy growth and development, in addition it favors the sustainability and reduction of social inequalities (1,2). Preterm birth (PB) defined as childbirth occurring at less than 37 completed weeks (WK) or 259 days of gestation, is a major determinant of neonatal mortality and morbidity and has long-term adverse consequences for health (3,4). Children who are born prematurely have higher rates of cerebral palsy (CP), sensory deficits, learning disabilities and respiratory illnesses compared with children born at term. The morbidity associated with preterm birth often extends to later life resulting in enormous physical, psychological and economic costs (5,6,7).

For Premature Newborn (PN), breast milk (BM) offers additional benefits such as lower incidence and severity of necrotizing enterocolitis (NEC), sepsis and retinopathy of prematurity (ROP), increased neuropsychological performance, strengthening of the mother-child bond, shorter length of hospital stay (LOS), and shorter incidence of readmissions (8). Additional benefit effects of BM are related to improvements in an infant's antibody, rich of nutrients, enteral tolerance, and better neurodevelopmental outcome and recommends for all newborn infants (9). During Premature newborn (PN) hospitalization period in Neonatal Intensive care Unit (NICU), their feeding method may need a change in cases such as low-volume milk feeding, taking complements with milk, or cessation of BM due to prolonged hospitalization. In these cases, feeding should be administered through another.

nutritional support in the first weeks after birth not only lead to a higher survival of Premature newborn PN and neonates in a very critical condition, but also facilitate their brain and neural development (11). Aiming to save children's lives, WHO developed a set of recommendations, including Exclusive breast feeding (EBF) up to six months and avoidance of bottle-feeding, safe complementary foods at six months and

supporting Various studies evidenced better cognitive development and intelligence quotients in breastfed infants compared to bottle-feed ones (12). Previous studies have shown that bottle-feeding was a key factor for child morbidity and mortality in different settings (13,14,15). This study aimed evaluate the importance and the effect of breast feeding on preterm infants with various gestational ages and difference in outcome , length of hospital stays LOS and complications regarding types of milk which not studied before in Tobruck City.

Materials and Methods

Study Design

A prospective case control study was performed in NICU at Tobruck Medical Center. All preterm infants with gestational age less than 37 weeks admitted to NICU from 1stJan.2019 until 1stJan.2020 enrolled in this study. This study includes all preterm newborns admitted in the nursery. Babies with congenital anomalies and died before 7 days of life was excluded. And newborn with 37 or more gestational age GA.

The Data was collected by using a designed perform direct questionnaire from mothers at admission by author himself as well as by reviewing the medical records of the babies which filled by resident doctors in the unit, detailed history including : demographic data of mothers and her babies was taken, gender, nationality GA, mode of delivery , age and nationality of mother ,blood group of mother and her baby and antenatal history of maternal diseases , types of milk, route of feeding, time of feeding initiation ,volume of 1st feeding, feeding intolerance and short term complications , examination including WT of babies on admission and discharge and general observation, laboratory and radiological data ,management and O2 therapy, Length of hospital stay LOS and outcome.

Ethical Approval

This study protocol was approved by the ethics committee of the Scientific Research in Tobruk University and patients were informed about the research and gave their verbal consent.

Results

The study included 52 premature newborn, 29 males (55.8%) and 23 females (44.2%) with GA ranging (28-36 weeks) and Birth weight BW ranging (900-3.600 grams) as listed in table (1) and figure (3), All newborns were Libyan with maternal age ranging (17-37 yrs.) as showed in figure (1), were the and Length of hospital stay LOS ranging (1-55 days).

Table (1): Demographic Data of Premature Newborn

No. %		No. %	No. %
Mean±SD		Mean±SD	
Gestational age in weeks		Gestational age in weeks	
32.10		32.10	
Birth weight by grams		Birth weight by grams	
Gender	1876.173	1876.173	1876.173
	No. %	No. %	No. %
Mode of delivery	Mean±SD	Mean±SD	Mean±SD
	Gestational age in weeks	Gestational age in weeks	Gestational age in weeks

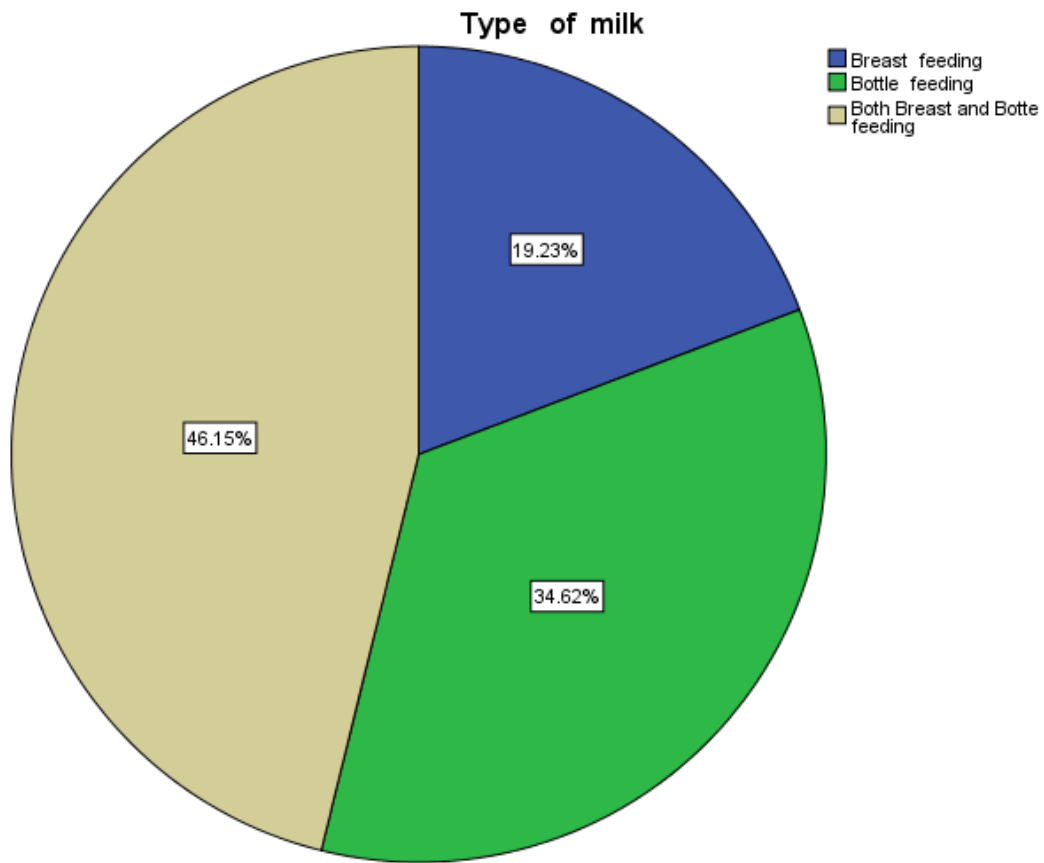


Figure (1): Type of milk

The total number of premature newborns were 52 where 10 (19.2%) newborn was on breast feeding and 18 (34.6%) on bottle feeding ,24(46.2%) was on mixed feeding

Table (2): Laboratory Data of Premature Newborns

Laboratory data	Minimum	Maximum	Mean \pm SD
S(albumin)	1.5	4	3.21538 \pm 0.497990
ALK phosphatase	118	404	273.98 \pm 60.493
Sodium	128	146	137.0904 \pm 4.34219
Potassium	3.5	6.7	4.7558 \pm 0.66197
Calcium	9	10.3	7.8404 \pm 1.33259
Urea	12	73	318942 \pm 12.85171
Creatinine	0.4	1.4	0.8038 \pm 0.20576
RBS	33	140	72.12 \pm 20.767
WBC	6.2	32	14.2519 \pm 5.83362
HCT	23	58	42.3706 \pm 8.18231
HB	6.3	19.8	145510 \pm 2.82407
PLT	56	398	228.63 \pm 75.720

Table (3): Complications among Studied Premature

Complication	NO.	Percent %
Anemia	3	5.8%
Apnea	3	5.8%
Nosocomial infection	2	3.8%
no complication	34	65.4%
Jaundice	1	1.9%
Anemia + NEC + Nosocomial infection	2	3.8%
Anemia + Apnea + BPD+ NEC + Nosocomial infection	1	1.9%
Apnea + NEC+ Nosocomial infection	1	1.9%
Apnea + Nosocomial infection	1	1.9%
Apnea + Convulsion	1	1.9%
Anemia + Jaundice+ Septic arthritis	1	1.9%
Anemia+ Nosocomial infection	1	1.9%
Anemia + Apnea	1	1.9%

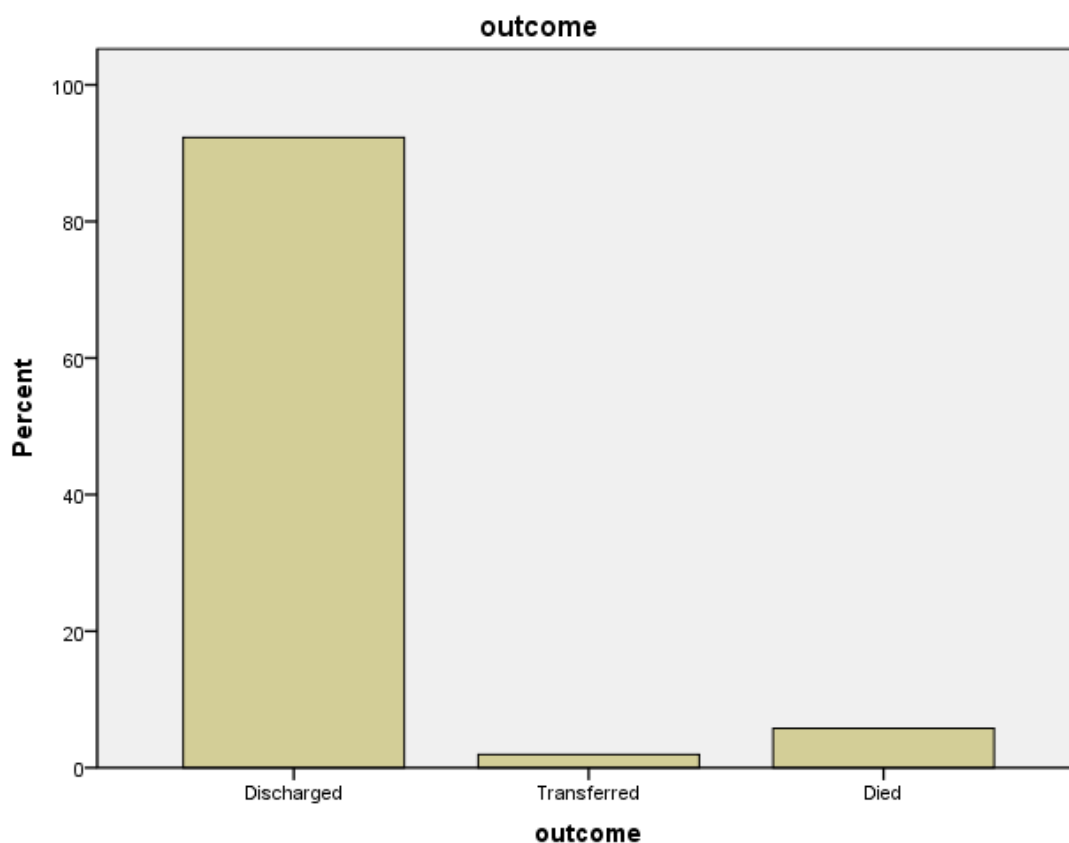


Figure (2): Outcome among studied newborns

The Outcome was 48 discharged (92.3%), 1 transferred (1.9%), 3 died (5.8%).

Table (4): Type of Milk and CRP

Type of milk	CRP (C reactive protein) :		Total
	Negative	Positive	
Breast feeding	6	4	10
Bottle feeding	15	3	18
Mixed feeding	18	6	24
Total	39	13	52

Table (5): Type of Milk and Weight on Birth

Type of milk	Birth weight groups			Total
	<1200g	(1200-2000g)	>2000g	
Breast feeding	3	6	1	10
Bottle feeding	1	7	10	18
Mixed feeding	2	12	10	24
Total	6	25	21	52

Table (6): Type of Milk and Weight on Discharge

Type of milk	Wight on Discharge Groups		Total
	(1200-2000g)	>2000g	
Breast feeding	8	2	10
Bottle feeding	8	10	18
Mixed feeding	11	13	24
Total	27	25	52

Table (7): Type of milk and complications

Complications	Type of milk			Total
	Breast feeding	Bottle feeding	Mixed feeding	
Anemia	0	1	2	3
Apnea	0	2	1	3
Nosocomial infection	0	0	2	2
no complication	7	13	14	34
Jaundice	0	1	0	1
Anemia + NEC + Nosocomial infection	0	1	1	2
Anemia + Apnea + BPD+ NEC + Nosocomial infection	0	0	1	1
Apnea + NEC+ Nosocomial infection	1	0	0	1
Apnea + Nosocomial infection	0	0	1	1
Apnea + Convulsion	1	0	0	1
Anemia + Jaundice+ Septic arthritis	0	0	1	1
Anemia+ Nosocomial infection	1	0	0	1
Anemia + Apnea	0	0	1	1
Total	10	18	24	52

Table (8): Type of milk and LOS

Type of milk	LOS Groups		Total
	1-7 days	more than 7 days	
Breast feeding	4	6	10
Bottle feeding	12	6	18
Mixed feeding	8	16	24
Total	24	28	52

Table (9): Time of feeding initiation and LOS

Time of feeding initiation	LOS Groups		Total
	1-7 days	more than 7 days	
1	3	0	3
2	14	2	16
3	5	7	12
4	2	7	9
5	0	2	2
6	0	5	5
7	0	3	3
8	0	1	1
10	0	1	1
Total	24	28	52

Table (10): Time of feeding initiation and outcome

Time of feeding initiation	Outcome			Total
	Discharged	Transferred	Died	
1	3	0	0	3
2	15	0	1	16
3	10	0	2	12
4	9	0	0	9
5	2	0	0	2
6	4	1	0	5
7	3	0	0	3
8	1	0	0	1
10	1	0	0	1
Total	48	1	3	52

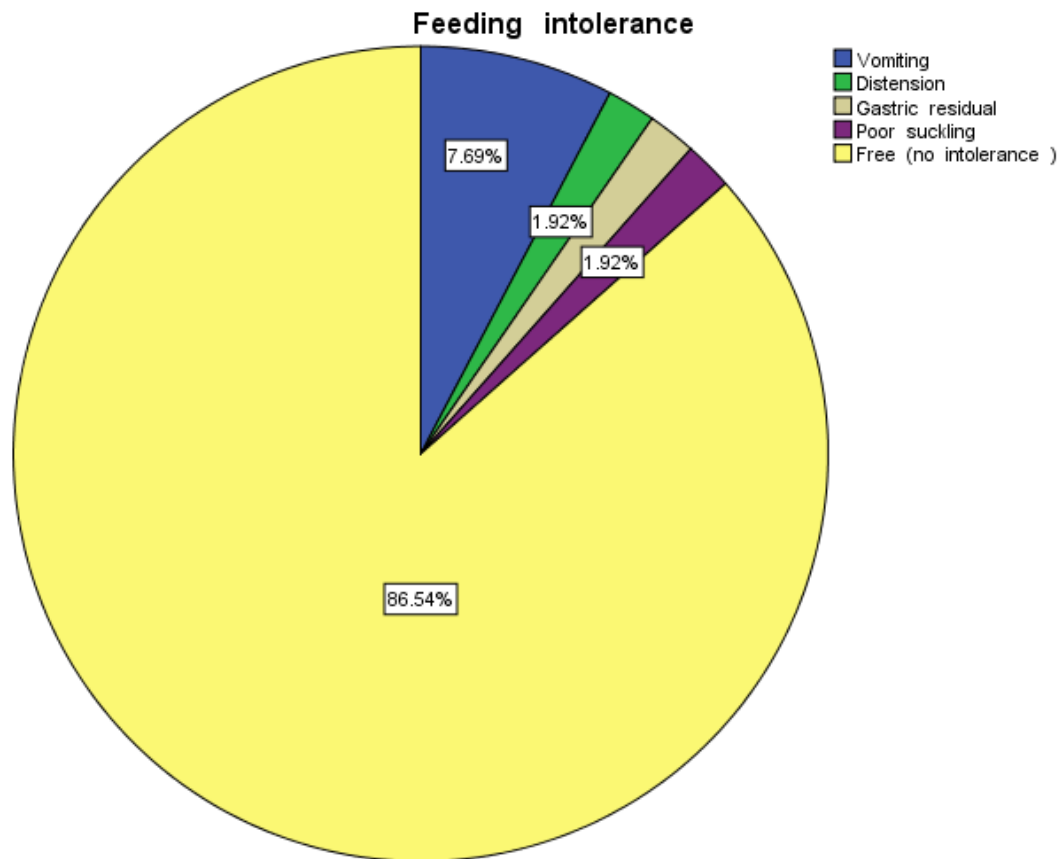


Figure (3): Feeding intolerance

Regarding feeding intolerance 45 (86.5%) newborns were not have intolerance ,4 (7.7%) developed vomiting and 1 (1.9%) newborn have distension ,1 (1.9) with gastric residual ,1 (1.9%) has poor sucking .

Discussion

This is a prospective study over 12 months period was conducted on 52 premature babies admitted in the nursery of Tobruck Medical Center from 1stJan. 2019 till 1stJan. 2020. The study included 52 premature newborn, 29 males (55.8%) and 23 females (44.2%) with GA ranging (28-36weeks) and birth weight ranging (900-3.600 grams). All newborns were Libyan with maternal age ranging (17-37 yrs.) and the Length of hospital stay LOS ranging (1-55 days).

The most common reported maternal diseases in this study were Urinary tract infection UTI (15,38%) followed by vaginitis and Urinary tract infection UTI (7,69%), other diseases (1.92%), but the majority 62% without any disease. While Leung T.N., et al. (16). found that hypertensive disorders of pregnancy, gestational diabetes, antepartum

hemorrhage, and congenital malformations were significant risk factors for spontaneous preterm labor.

Regarding type of feeding of studied preterm there were 10(19.2%) newborn was on breast feeding and 18 (34.6%) on bottle feeding, 24(46.2%) was on mixed feeding. Regarding of milk formula type 40 (76.9%) newborn was on premature milk formula and 2(3.8%) on full term milk formula while 10 (19.2%) newborn was on breast milk. The time of feeding incitation was range (1st -10th), mean 3.58 ± 1.954 SD days and volume of 1st feeding ml/kg (3-10), mean 5.79 ± 2.304 SD. feeding intolerance reported as 4 (7.7%) developed vomiting and 1 (1.9%) newborn have distension ,1 (1.9) with gastric residual .

The laboratory data different from premature newborn to other where s. albumin was range (1.5-4) ,ALK Ph (118-404) ,Na(128-146) , K (3.5-6.7),Ca (9-10.3),BUN (12-73), Cr (0.4-1.4) ,RBS (33-140) , WBC(6.2-32),HCT (23-58),HB (6.3-19.8),PLT was range (56-398). Regarding the complication happen in preterm enrolled in this study 3(5.8%) complicated with anemia, apnea, 2 (3.8%) nosocomial infection, 1 (1.9%) jaundice ,1 (1.9%) mixed complication ,were 34 (65.4%) not have complication. 92% of enrolled preterm discharged, 2% transferred and 6% died. We found no significant correlation between types of feeding and inflammation risk (CRP marker) with p-value = .393 like Zhongguo Dang et al. (17) and Liyw et al. (18) that found no difference in nosocomial infection incidence in both bottle- and breast-feeding group. This disagrees with Beijing Da et al. (19). That showed decrease the incidence of sepsis with breast feeding group and feeding intolerance. Also, three observational studies one non-randomized trial (20), one interrupted time series (21) and one cohort study (22), there was a possible reduction in late onset sepsis with EBF unlike our result.

Our study results are showing the higher mortality was happen in breast feed newborns. While the bottle feeding, and mixed feeding groups of preterm newborns discharged without any mortality. So, there is strong correlation between types of feeding and outcome with P- value= .001 In O'Connor DL, et al. (23) was found the growth to be inversely proportional to the consumption of human milk. However, assessment of neurological development revealed that infants fed Maternal milk (MM) showed a better performance and Researchers have shown that, among preterm infants, breastfeeding provides better health outcomes for both the infant and mother (24,8,25).

Other studies that compared breastfed neonates and neonates receiving a milk formula also showed a better weight (WT) gain among those fed a formula, although without any beneficial effect on neurological development (26,27).

While our study found weight WT gaining more with both mixed and bottle feeding than breast feeding and there is no significant correlation in our study between type of milk and weight WT gaining with p value = .141 and our study didn't assist the neurological development of newborns. This result like a review published in 2014, British investigators who analyzed 9 trials comparing the risks and benefits of feeding preterm low birth weight babies with maternal milk MM from donors or with infant milk formula observed greater weight gain, length, and head circumference in the group of infants receiving formula during hospitalization (8).

Other studies did not observe greater weight and length gain among premature babies receiving a formula, with results un similar to those detected in the present study. with no significant differences in weight gain in infants fed MM compared to infants receiving a formula maayan- metzger A,et al.(28) & Cristofalo et al.(29) while Carlson 1998 (30) found higher weight gain with EPTF versus EBF over the time periods 15–35 days and 57 days to term, ,In contrast, Manea A,et al. (20) reported greater weight gain (g/d) in the Exclusive breast feeding EBF group during the first five weeks of life. Quigley M, et al. (8) noted, the risk of occurrence of Necrotizing enterocolitis NEC was higher in bottle feeding group of infants. And a review study conducted on 400 preterm babies with a $GA \leq 30$ weeks observed a lower prevalence of Necrotizing enterocolitis NEC and ROP(28) Also during hospitalization, human milk feeding is related to less occurrence of Necrotizing enterocolitis NEC, sepsis and Urinary tract infection UTI, decreased gastric pH, increased gastrointestinal motility, accelerated mucosal immunity, improved gut microflora, and decreased mucosal permeability leading to reduced bacterial translocation. The benefits of human milk remain after discharge as they improve indexes of neurodevelopment that persists into adolescence, avoiding obesity, precocious puberty and other problems (31,32).The observational studies show there is a possible reduction in any Necrotizing enterocolitis NEC with Exclusive breast feeding EBF compared with Exclusive premature formula EPTF ,two cohort (21,33) and one non-randomized studies (20) reported this comparison for any NEC. Observational studies have found higher rates of Necrotizing enterocolitis NEC in infants fed formula compared with MM B (Battersby 2017) (34).

Meta-analysis of data from randomized controlled trials indicates that feeding with formula, compared with donor breast milk, leads to higher rates of feed intolerance and Necrotizing enterocolitis NEC in preterm infants (QuigleyM) (8). Also has been reported by [24,35 ,36 ,23]. that premature infants who are breastfed have lower incidence of Necrotizing enterocolitis NEC and late-onset sepsis and they have better feeding tolerance and neurodevelopmental outcomes. All these results agree with our results as we found the NEC happen more in bottle and mixed formula feeding groups rather than breast milk group Although complication in our study less occur with newborn on breast feeding. Our study results are showing the higher mortality was happen in breast feed newborns. While the bottle feeding, and mixed feeding groups of preterm newborns discharged without any mortality. So, there is strong correlation between types of feeding and outcome with P- value= .001 We found that there is no significant correlation in this study between the gender of preterm babies and outcome.

The complications in our study less occur with newborn on breast feeding, while Zhongguo Danget al. (17) and Li YW et al. (18) found no difference in breast- and bottle-feeding groups regarding complications. We found no significant correlation in our study between type of milk and Length of hospital stay LOS with p value = .091. like (17) and (18) found no difference in Length of hospital stay LOS in both bottle and breast feeding premature with GA 28-30 weeks and 34-36Ws, while decrease of Length of hospital stay LOS in breast feeding premature with GA 31-33Ws. Increase in weight WT in low-birth-weight LBW and Very low birth weight VLBW Infants Fed Fortified Breast Milk versus Formula Milk: A Retrospective Cohort Study Lok, K., et al. (37). Observed differences seen could also be due to a reverse causation effect because mothers of more fragile infants are more likely to breastfeed owing to the potential benefit of better recovery; therefore, these infants could have longer lengths of stay and more parenteral feeding days. Thus, Length of hospital stay LOS and parenteral feeding days are not causally related to breast milk feedings. Our study results are showing the early oral feeding initiation decrease length of hospital stay LOS, so there is strong correlation between time of feeding initiation and LOS with p value = .001 We conclude no significant correlation between time of feeding initiation and outcome in studied premature with p value =.630

We noted no significant correlation in this study between feeding intolerance and outcome in premature babies with p value = .009 While (17) and (18) found the

breastfeeding group had a significantly faster increase in body weight, a significantly lower incidence rate of feeding intolerance.

Conclusion

The main result of this study was finding the effect of breast feeding versus Formula Milk Feeding on growth and short-term outcomes among preterm infants in Neonatal Intensive Care Unit at Tobruck Medical Center. We conclude no significant correlation between time of feeding initiation and feeding intolerance and gender and outcome in premature babies. We found a strong correlation between types of feeding and outcome and fewer complications happen in premature babies on breast milk.

We conclude that the early oral feeding initiation decrease Length of hospital stay LOS in preterm babies. And more weight gain among bottle and mixed bottle and breast feeding rather than exclusive breast feeding. Prevention of prematurity is the main goal, so a better understanding of the high-risk groups is required to improve care and encouraging of early and continuous breast milk feeding for all premature newborns is the main target in our NICU.

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