Ages and Gender Differences in Patients with COVID-19: Focus on severity of clinical characteristics

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المستخلص

كورونا (كوفيد 19) مرض فيروسي يتسبب في اعراض من بسيطة الي متوسطة الشدة ، في بعض الاحيان تتطور الاعراض بعد اسبوع او اكثر الي ضيق في التنفس ، و قد تتطور الحالات الي اوضاع حرجة و التي تشمل اضطراب و فشل تنفسي حاد و التي تهدد حياة المريض . هذه البحث يهدف الي تقييم انتشار فيروس كوفيد 19 فيما بين افراد المجتمع و بالتالي اخذت عينات عشوائية للمساهمة في التقييم من حيث انتشار الفيروس و شدة الاعراض المتسببة عنه في مجتمع الدراسة. تم جمع بيانات 90 حالة موجبة لفيروس كوفيد 19 (45 حالة من مركز مكافحة الأمراض بترهونة (الهلال) و 45 حالة من مستشفى الطب الوقائي مركز العزل معيتيقة مدينة طرابلس) . الحالات كانت بدرجات مختلفة من حيث شدة الاعراض حيث صنفت الحالات حسب الاعراض الي حالات خفيفة و متوسطة و شديدة . الدراسة اظهرت من خلال اختبار مربع كاي ان للعمر تاثيرا عالي المعنوية علي انتشار و شدة المرض (0.01 =P) ، حسب المجموعة العمرية بلغت نسبة الافراد و الذين اظهروا اعراضا حادة بالفئة العمرية (61 سنة فما فوق) 93.75٪ ، في حين الافراد بالفئة العمرية (17 سنة او اقل) لم تسجل اي حالة باعراضا حادة . المجموعة العمرية الثالثة (18–35 سنة) سجلت ما نسبته 7.5٪ كحالات حادة . اخيرا المجموعة العمرية الرابعة (36–60 سنة) الحالات الشديدة كانت 26.9٪ من عدد الافراد بهذه المجموعة . اعلي نسبة للحالات الحادة كانت بالافراد الذين ينتمون للفئة العمرية (61 سنة فما فوق) . حسب جنس الفرد نتائج الدراسة احصائيا لم تكن معنوية (0.05 =P) وكانت كالتالي : 37٪ من الحالات الموجبة بالذكور اظهرت اعراضا حادة بينما 19٪ فقط من الحالات الموجبة بالاناث كانت لديهن اعراضا حادة ، تبين من خلال النتائج ان الحالات ذات الاعراض الخفيفة بالذكور كانت 28٪ و الحالات ذات الاعراض المتوسطة كانت 35٪ و النسبة الاكبر كانت للحالات الشديدة 37٪ ، في حين كانت النسب للحالات الموجبة ذات الاعراض الخفيفة و المتوسطة و الشديدة في الاناث 40٪ و 40٪ و 19٪ علي التوالي .

Abstract:

COVID 19 viral disease caused Mild/Moderate symptoms, sometimes patients experienced dyspnea after 1 week. Severe patients progressed rapidly to Critical conditions which might be lead to death that included symptoms such as acute respiratory distress syndrome (ARDS), acute respiratory failure. This study aimed to analysis of prevalence of COVID 19 among randomized samples to contribute in the evaluation of the prevalence and severity of COVID 19 in the society. Therefore, 90 cases (45 from Tarhuna and 45 from Tripoli) were examined. All data regarding cases of COVID 19 in different clinical classes of severity have been classified as slight moderate, and severe cases according to symptoms. The current study is showed by the chi square test that the ages exhibit highly significant prevalence COVID 19 (P= 0.01). According to the age group individuals who having severe symptoms represent 93.75%   belongs to age group 61 ≤ years old, whereas age group (17 ≥years old) did not not record any case with severe symptoms, The third age group (18-35 years old), represent 7.5% as severe cases. Lastly the fourth age group (36-60 years old) cases with severe symptoms represent 26.9%, The highest cases with severe symptoms were in the age group 61 ≤ years old. According to the gender the finding in this research wasn't significant (P= 0.05) as following, 37% of male's cases have severe illness whereas just 19% of female's cases have severe illness, Results showed that males who having slight, moderate, severe symptoms represent 28%, 35%, 37% respectively whereas Females who have slight, moderate, sever symptoms represent 40%, 40%, 19% respectively.
key words: COVID 19 Slight, Moderate, Sever, Symptoms

Introduction:

Coronavirus disease (COVID-19) is official name of the 2019 novel coronavirus (Thompson 2020 & Calisher et al. 2020). International Committee on Taxonomy of Viruses named the virus of (COVID-19) severe acute respiratory syndrome coronavirus 2 (SARS-CoV- 2) (Coronaviridae Study Group 2020). People of all ages can be infected by the COVID-19 virus. Both older and younger person can be infected by the COVID-19 virus. Illnesses ranging from the common cold to severe pneumonia can be caused by viruses belong to family of coronavirus, such as SARS (Drosten et al 2003) and Middle East Respiratory Syndrome (MERS) . (Zaki et al 2012). SARS-CoV-2 (COVID 19) was first discovered in Wuhan, China, by the Chinese Center for Disease Control and Prevention (CDC) (Zhu et al. 2019).The Chinese health authority announced in December 2019 that

a novel coronavirus disease (COVID-19) occurred and then rapidly spread throughout China, putting the world on alert. High throughput sequencing has revealed a novel b-coronavirus that is currently named severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) (Zhu et al. 2019), which resembles severe acute respiratory syndrome coronavirus (SARS-CoV) (Drosten et al 2003). Most patients with COVID-19 were Mild/Moderate patients who often experienced dyspnea after 1 week. Severe patients progressed rapidly to Critical conditions, which included symptoms such as acute respiratory distress syndrome (ARDS), acute respiratory failure, coagulopathy, septic shock, and metabolic acidosis. Early identification of risk factors for Critical conditions is urgently needed, not only to identify the defining clinical and epidemiological characteristics with greater precision, but also to facilitate the appropriate supportive care and prompt access to the intensive care unit (ICU) if necessary.

Aim of this study:

The aim of this study is to evaluate the conditions of COVID 19 in Tarhuna city and to base on data has been collected from those who visit National Centre of Disease Control in Tarhuna and isolation Centre Amitika in Tripoli during period between September to December 2021.

Material and Methods:

Study Population. This study was conducted in Tarhuna city with results of ninety subjects those have been collected for the substantiate the study.

Sample: The sample was 90 subjects (43 males and 47 females). Almost of them were Libyan nationals living in the Western region of Libya. The samples were collected during the year 2021.

Nasopharyngeal Sampling and Laboratory Analysis A specimen has been collected with Sterile swab from one nostril, inserting the swab into the nostril to the nasopharynx and rotating against the wall. Subsequent investigation has been done either using PCR technic or antigen rapid test to detect if the sample positive or negative of COVID 19. In this study according to the clinical signs of each patient who is positive of COVID 19, there are 3 major groups have been set : cases of slight symptoms, the patient in this group has shown no symptoms and does not suffer from any illness, cases of moderate symptoms has shown mild symptoms and patient does not require mechanical ventilation, cases of severe symptoms here patients require mechanical ventilation.

Statistical analysis

Positive cases by corona virus are compared as per the mentioned categories (slight symptoms, moderate and severe symptoms) between gender and ages, the ages have been divided into four groups Data presented in tables 1 and 2. Comparison among gender and ages were conducted using chi-square test. Data were then presented in tables and figures. The data presented according to the clinical classification of severity (slight, moderate and severe) considering gender and ages as show in table 1 and 2 respectively.

Table 1: The number of male and female who has slight, moderate and severe symptoms

Gender	Slight	Moderate	Severe	Total
Male	12	15	16	**43**
Female	19	19	9	**47**
Total	31	34	25	**90**

Table 2: The number of each age group that has slight, moderate and severe symptom

Severity of symptoms	Slight	Moderate	Severe	Total
17 ≥ Years	6	2	0	**8**
18-35 Years	19	18	3	**40**
36-60 Years	6	13	7	**26**
61 ≤ Years	0	1	15	**16**
Total	31	34	25	**90**

Result and Discussion

The data presented in table 2 is used to test if the ages and severity of symptoms are independent or not, so the result of chi square test was high significant ($P < 0.01$), the test shows that severity of symptoms influenced by the age of individual, Fig 1 represents the total cases with different symptoms (slight, moderate and sever) depend on age. The fig (1) is clearly shown that age group $61 \le$ years old are severely ill with the virus, the number of individuals who having severe symptoms represent 93.75% the raise of percentage due to poor immune functioning for older people (Eileen 2019). also some diseases such as heart disease, hypertension, lung disease and Diabetes much common in older people making COVID 19 more serious for those people (Centers for Disease Control and Prevention Coronavirus Disease 2019 Response Team. (2020)). These conditions associated with high expression of a protein called angiotensin

converting enzyme 2 which make binding of COVID-19 viruses to cells(Eileen 2019). In contrast there was no case recorded with severe symptoms in side age group (17 ≥years old), The third age group (18-35 years old), there were 3 out of 40 cases recorded as severe symptoms represent 7.5%. The forth age group(36-60 years old) cases with severe symptoms were 7 out of 26 represent 26.9% the age group (36-60 years old) comes second one in terms of highest cases with severe symptoms . The highest cases with severe symptoms were in the age group 61 ≤ years old, additional suggestion here due to changes in the immune system by age as person becomes older the availability of T cells to deal any new antigen become depleted which lead to poor response to COVID 19 in the age group 61 ≤ years, this finding are similar to previous discoveries (Aviv 2020). It is very obviously from Fig (2) that number of people who have severe symptoms increase markedly with age.
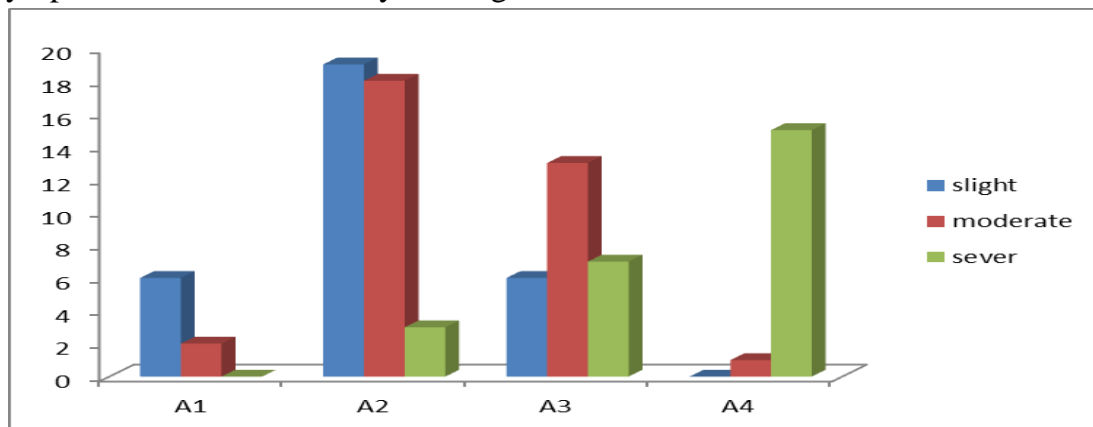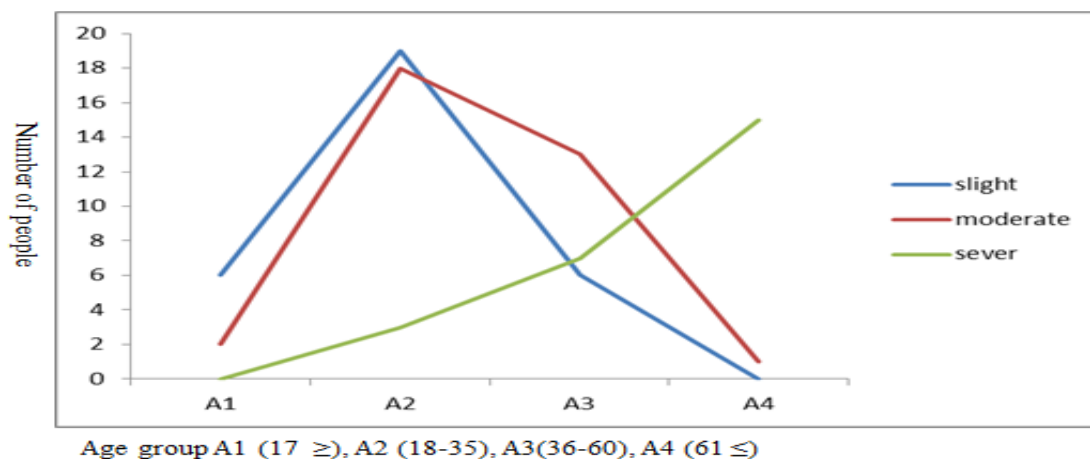

Fig 1: The number of each age group that has slight, moderate and severe symptoms

Age group A1 (17 ≥), A2 (18-35), A3(36-60), A4 (61 ≤)

Fig 2: Increase severe symptoms as the age increase

Fig 3 shows the observed number of male and female who have the slight, moderate and severe symptoms, from fig 3 it is noted that number of males who have severe illness with COVID 19 are the highest number whereas the number of females who have severe illness are the lowest number. Comparison between gender has been done using chi square test. Chi square (X^2) test indicated that men's cases of COVID-19 tended to be the same women's (the test was not significant). In contrast other studies reported that men are more influenced with COVID 19 than women (Karlberg et al. 2004), similar finding was reported in other study showed that men were more likely to test positive (Stall et al. 2020 & Lochlainn et al. 2020). 72% of COVID 19 cases were males in Pakistan (Adams 2020). According to Global Health 5050 data, the number of COVID-19 confirmed cases and the death rate due to the disease are high among men in different countries (Compston and Confavreux 2006 & Wenham et al. 2020 & Villa et al.2020), here result of Chi square in this study not significant this might be because behavioral factors and traditional culture, so women have more occasions and meeting at homes than men in the area of study that increase level of exposure lead to increase positive cases among women.
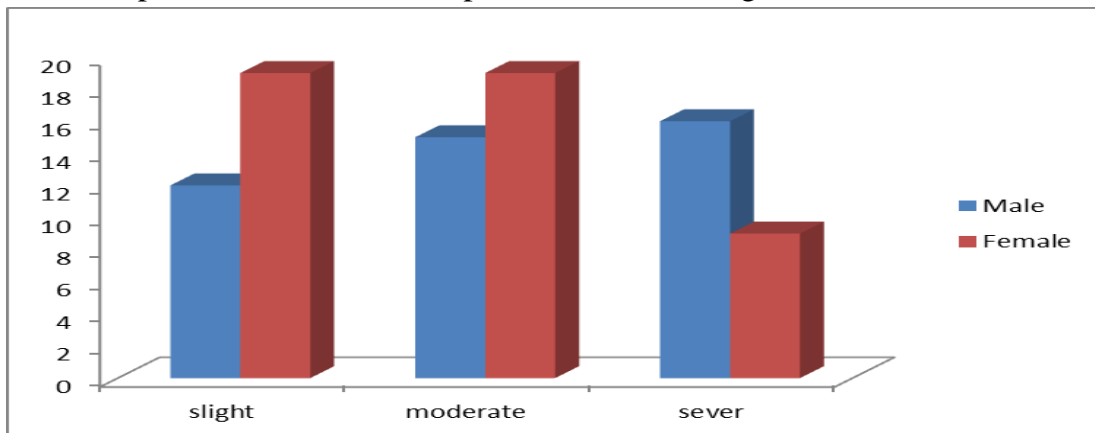

Fig 3: The number of cases that has slight, moderate and severe symptoms according to Gender

Fig 4 shows that 37% of male's cases have severe illness whereas fig 5 shows just 19% of female's cases have severe illness, which can be explained that women's immune systems are more effective than men as X chromosome is known to contain the largest number of immune-related gene in the whole genome, women with XX chromosome have a double copy of key immune genes compared with a single copy in XY in men (Klein and Flanagan 2016). This result appears to be in accordance with previous research done by Jian at el.

2020 which indicated that men's cases of COVID-19 tended to be more serious than women's
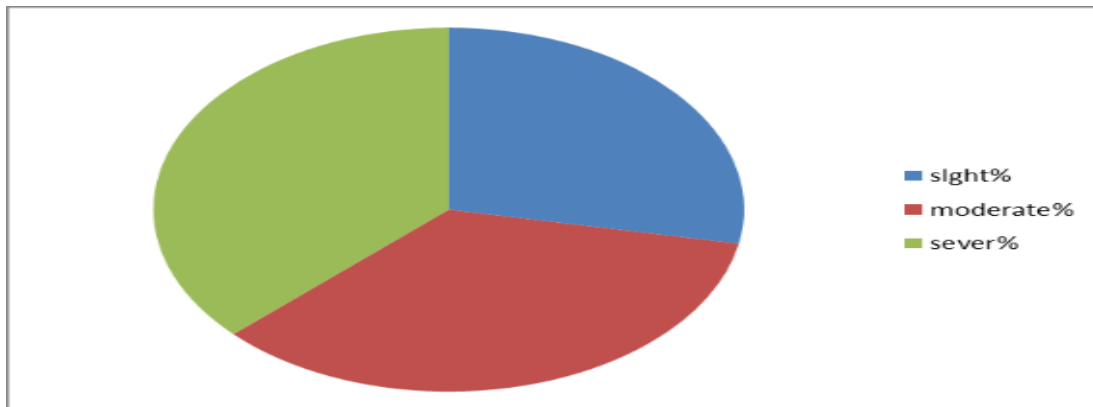
Figure 4: Number of male who have different symptoms as percentage. males who have slight, moderate, severe symptoms represent 28%, 35%, 37% respectively
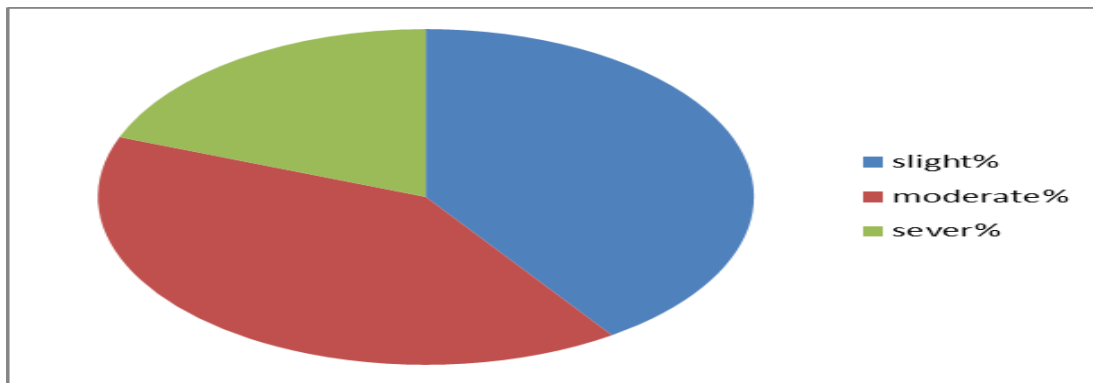
Figure 5: Number of female who have different symptoms as percentage. Females who have slight, moderate, severe symptoms represent 40%, 40%, 19% respectively

Conclusion:

Data of 90 subjects (43 males and 47 females). Almost of them living in the Western region of Libya. The samples were collected during period between September 2021 to December 2021, The current study showed that there was significant differences between age categories so 93.75% of cases within the age group 61 ≤ years old recorded as severe cases. No cases recorded as severe within age group (17 ≥years old). The age group (18-35 years old) and age group (36-60 years old) recorded 7.5% and 26.9% as severe cases respectively. In addition, the result showed that there were no significant differences between male and female regarding the prevalence and severity of COVID19.

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