

RESEARCH PAPER

The Dynamics of COVID-19 Epidemic in Basrah-Second Report

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Received: 28.05.2020

Accepted: 12.06.2020

Abstract

Background: COVID-19 pandemic still expanding across the world and continuing at modest scale in Basrah.

Objective: To further elaborate on COVID-19 epidemic in Basrah province and document the changing dynamic of the disease in terms of demographic characteristics, incidence, case fatality, geographical distribution and time trend.

Methods: This study covered COVID-19 cases reported in Basrah from March 9 to May 20, 2020. Two sources were used for obtaining data in this study. The first is an excel sheet containing information on 736 cases covering age, gender, residence, travel history, comorbidity and fate, which is obtained from The Department of Public Health in Basrah. The second is the daily numbers of new cases (also 736) obtained from the daily communiqué of the Ministry of Health. Statistical Package for Social Sciences (SPSS-version 20) and Excel programmes were used for statistical analysis.

Results: The mean age \pm SD was 35.5 ± 18.9 years (for males = 35.6 ± 19.0 and for females = 35.5 ± 18.8), the median was 34 years (males = 34 and females = 33). The incidence rate was higher in older age groups, females and three districts (Basrah city, Al-Hartha and Al-Mdaina). The case fatality was within the international figures and significantly predicted by age (older age is associated with high fatality), travel history and presence of co-morbidity. The epidemic curve is moderate, fluctuant and does not help yet in predicting an exit from the epidemic.

Conclusion: The epidemic of COVID-19 in Basrah is moderate, cluster in transmission and changing in time but is unpredictable.

Key words: COVID-19, Case fatality ratio, incidence rate

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Introduction

COVID-19 still represents a threat to the health of the population in Basrah despite the efforts to contain the spread of infection at community level. The epidemiology of the

disease is evolving and the complete picture is not complete yet at local and global levels.^{1,2} In our previous article¹ on COVID-19 in Basrah which covered cases reported from February 24 to April 10, 2020 we stated that the scale of COVID-19 epidemic was modest in Basrah and may continue as such for a period of time. Since then, the time trend remained moderate and the distribution across various administrative units of the province has relatively changed with variable risk became evident in these units. Active case detection among contacts of notified

cases revealed a number of clusters of undetected cases. In one place (Khura in Hartha district) the number of positive contacts detected was 37. The characteristics of detected cases might have changed as active surveillance revealed a tangible number of asymptomatic contacts. However the overall situation remained under control and no panic has occurred. The health authorities are enforcing every protective measure possible and the preparedness to accommodate increasing numbers who need hospital admission or quarantine is well maintained. However, the measures against the COVID-19 epidemic in the foreseeable future may need extensive reconsideration to encompass not only health aspects but also the consequences of the epidemic on population living and country economics.³ In order to update the epidemiological situation in Basrah and keep up with further development, we present further details on the characteristics of the affected persons and specific outcomes, eg., incidence rate, case fatality ratios and others, as of May 20, 2020. Also a further add on time trend of the epidemic curve is updated to encompass the period from March 9 to May 20, 2020.

Methods

Cases of COVID -19 are notified in Basrah and Iraq on the basis of single criteria; a case denotes a person with a positive nasal or oral swab Polymerase Chain Reaction Test (PCR). The triggers for the test were clinical features suggestive of the disease, contact with cases and history of an event of travel to other affected countries. The data used in this article are totally obtained from the official records of the epidemiological Unit at the Department of Public Health in Basrah.⁴ An excel sheet was

received covering reported cases in Basrah from March 9 to May 20, 2020. The sheet contained details related to age, gender, date of diagnosis, residence (administrative unit and quarter), type of case (passive or active detection), any travel history, presence of comorbidity (no details were obtained) and fate of patient (cured, died or under treatment). The data were imported into a statistical programme (Statistical Package for Social Science-SPSS-Version 20) for statistical analysis. These data were used for describing demographic characteristics (age, gender, residence) and outcome measures (incidence rate, case-fatality ratio and fate). For the description of the time trend of the epidemic (epidemic curve) the daily numbers covering the period from 9 March to 20 May, 2020two sources were used. A complete inventory which was made by the authors since the start of the epidemic. This inventory contained the daily reported cases and was based on the data available with Department of Public Health in Basrah and the daily report of the Ministry of Health. Verification and consolidation of reported cases were made by consulting the weekly situation reports issued by the Ministry of health⁵⁻⁸ and a number of international data generating websites.⁹⁻¹¹ The latter were used as indirect validation of reported data. Information on population of Basrah province and the nine sub-districts b (sectors) was based on estimates made by the Ministry of Planning and available at the Department of Public Health in Basrah.¹² For the purpose of this article the following definitions were used.⁹

Closed case: A case that has an outcome (Cured or died)

Incidence rate: The number of reported cases per 1000000 populations up to the designated

date.

Case fatality ratio for all cases: Number of deaths among COVID-19 reported cases up to the designated date divided by all reported cases over the same period (as percentage).

Case fatality ratio for closed cases. The number of deaths among COVID-19 cases reported up to the designated date divided by summation of deaths and recoveries over the same time period (as percentage).

Basrah province: refers to the official area and population as defined by legal system in Iraq. The data were transferred from an excel sheet into the Statistical Package for Social Science- Version 20 for the purpose of tabulation and statistical analysis Chi-squared (Or Fisher Exact Test) were used to explore associations in case of qualitative data. Excel functions were used to

prepare the required figures. Means were calculated by suitable function of the SPSS.

Results

The article presents data on 736 cases of COVID-19 infection reported in Basrah province over the period from March 9 to May 20 2020.

Age and gender

(Table-1) shows the distribution of COVID-19 cases according to age and gender. The mean age \pm SD was 35.5 ± 18.9 years (for males = 35.6 ± 19.0 and for females = 35.5 ± 18.8), the median was 34 years (males = 34 and females = 33). The two gender groups exhibited similar age pattern and overall age distribution was not statistically different between genders ($P = 0.521$).

Table 1. Distribution of COVID-19 cases by age and gender: Basrah province, March 9 to May20, 2020 Basrah province

Age	Male		Female		Total		P
	No.	%	No.	%	No.	%	
<10	28	8.9	29	6.9	57	7.7	0.521
10-19	39	12.3	72	17.1	111	15.1	
20-29	63	19.9	73	17.4	136	18.5	
30-39	49	15.5	71	16.9	120	16.3	
40-49	55	17.4	65	15.5	120	16.3	
50-59	50	15.8	59	14.0	109	14.8	
60-69	14	4.4	25	6.0	39	5.3	
70 and above	18	5.7	28	6.2	44	6.0	
Total	316	100.0	420	100.0	736	100.0	
Mean \pm SD (Median)	35.6 \pm 19.0 (34)		35.5 \pm 18.8 (33)		35.5 \pm 18.9 (34)		

Residence, travel history and co-morbidity

Table 2 shows that during the period from March 9 to May 20, 2020, most of the COVID-19 cases were reported from Basrah city (44.4%), Hartha district (25.8 % and Mdaina district (11.7%). Only 8 (1.1%) reported travel

history outside Basrah province. Of the total cases, 96 (13.0%) had co-morbidity and as on May 20, 2020, 270 (36.7%) were cured, 18 (2.4) died and the remaining 446 (60.9%) were under treatment or quarantine.

Table 2. Distribution of COVID-19 cases according to residence, travel history, co-morbidity and fate: Basrah province: March 9 to May 20, 2020

Residence	No.	%
Basrah City	327	44.4
Hartha	190	25.8
Qurnah	22	3.0
Mdainah	86	11.7
Zubair	19	2.6
Abul-Khasib	60	8.2
Shat Al-Arab	32	4.3
Travel history		
Present	8	1.1
Absent	728	98.9
Co-morbidity		
Present	96	13.0
Absent	638	87.0
Fate		
Cured	270	36.7
Died	18	2.4
Under treatment	446	60.9
Total	736	100.0

Incidence rates

The extent of risk expressed as incidence rate per million populations according to age, gender and residence is shown in Table 3. With respect to age, the incidence rates increase steadily with advancing age reaching a peak (951.4 per million) at the age of 70 years and above. The incidence rate for females was higher (285.4 per million) than for males (208.8 per million). Regarding residence (district), Hartha, Mdainah and Basrah city had the highest incidence rates in that order as compared to other districts. The Overall incidence rate for Basrah province as of May 20, 2020 is 246.6 per million.

Table 3. Incidence rates of COVID-19 infection according to age, gender, and residence: Basrah province, March 9 to May 20, 2020.

Variable	Population	Cases	IR/1000,000
Age			
<10	865,796	57	65.8
10-19	671,767	111	165.2
20-29	496,870	136	273.7
30-39	395,376	120	303.5
40-49	277,739	120	432.1
50-59	142,072	109	767.2
60-69	92,538	39	421.5
70 and above	46,248	44	951.4
Gender			
Male	1,513,434	316	208.8
Female	1,471,641	420	285.4
Sector/District			
Basrah city	1,047,760	327	304.0
Hartha	405,495	190	468.6
Quranah	176,119	22	124.9
Mdainah	264,179	86	325.5
Zubair	594,030	19	32.0
Abul-Khasib	320,895	60	187.0
Shatt-Al-Arab	176,119	32	181.7
Total	2985075	736	246.6

Fatality

The case fatality ratio for all cases was very variable across age, gender, residence and co-morbidity groups as shown in Table 4. No death was reported in persons aged less than 30 years and the highest case fatality ratio was in persons aged 70 years and above (20.5 %). Gender-wise the case fatality was higher in male cases but the difference was statistically not significant ($P = 0.145$). Regarding the district of residence deaths were reported for cases in Basrah city, Abul-Khasib and Shatt Al-Arab districts. No deaths were reported in cases from other districts. The highest case fatality ratio was in Shatt Al-Arab district (9.4%). Presence of co-morbidity carried a significant impact on the risk of death with case fatality ratio being

significantly higher (13.5%) among cases with co-morbidity as compared to cases with no co-morbidity (0.8%) The overall case fatality ratio was 2.4% for all cases and 6.3% for closed cases (cases with outcome).

Table 4. Fate of COVID-19 cases according to age, gender, residence and co-morbidity: Basrah province, March 9 to May20, 2020.

Variable	Alive (No.)	Died (No.)	Case fatality ratio for all cases	P Value
Age				< 0.001
<10	57	0	0.0	
10-19	111	0	0.0	
20-29	136	0	0.0	
30-39	119	1	0.8	
40-49	119	1	0.8	
50-59	103	6	5.5	
60-69	38	1	2.6	
70 and above	35	9	20.5	
Gender				0.145
Male	307	9	2.8	
Female	411	9	2.1	
Residence				0.017
Basrah city	313	14	4.3	
Hartha	190	0	0.0	
Qurnah	22	0	0.0	
Mdaina	86	0	0.0	
Zubair	19	0	0.0	
Abul-Khasib	59	1	1.7	
Shatt Al-Arab	29	3	9.4	
Co-morbidity				< 0.001
Present	83	13	13.5	
Absent	635	5	0.8	
Total	718	18	2.4	

Factors predicting fatality

A logistic regression analysis was done to identify the independent significant predictors of case fatality. The dependent variable was

dichotomous whether a person was dead or alive as to May 20. The independent variables were age (continuous), presence of co-morbidity (dichotomous) and district of residence (dichotomous as Basrah city versus others) and travel history (dichotomous). The results are shown in (Table-5). Older age, presence of travel history and co-morbidity predicted high fatality. These three variables are independent significant predictors of case fatality associated with COVID-19 infection in Basrah province. Residence was not significant predictors of fatal outcome.

Table 5. Logistic regression analysis to predict fatality among COVID-19 cases in Basrah province.

Variable	B	OR	95% CI for OR		P Value
			Lower	Upper	
Age (younger)					
Present of	0.073	0.929	0.901	0.959	0.000
Travel history	2.233	9.329	2.202	39.523	0.002
Presence of	1.257	3.516	1.265	9.779	0.016
Co-morbidity					
Residence	0.734	2.083	0.673	6.442	0.203

Dynamics of the epidemic curve

The time trend of reported daily cases is illustrated as an epidemic curve in Figure 1. Characteristic features can be identified. First, fluctuation of reported cases over time with many peaks and dips in the curve. Second, apart from few days when the numbers are relatively large (e.g., March 27 and April 28 and 29), otherwise the curve is an expression of low scale epidemic throughout the almost nine weeks since the onset of the epidemic in Basrah. The epidemic started as few sporadic cases during the first two weeks then it changed to daily cases throughout the following seven weeks. The epidemic curve for cumulative cases (Figure-2) shows a steady ladder pattern increase in the cumulative cases. The ascending curve is not very sharp but it does not flattened yet.

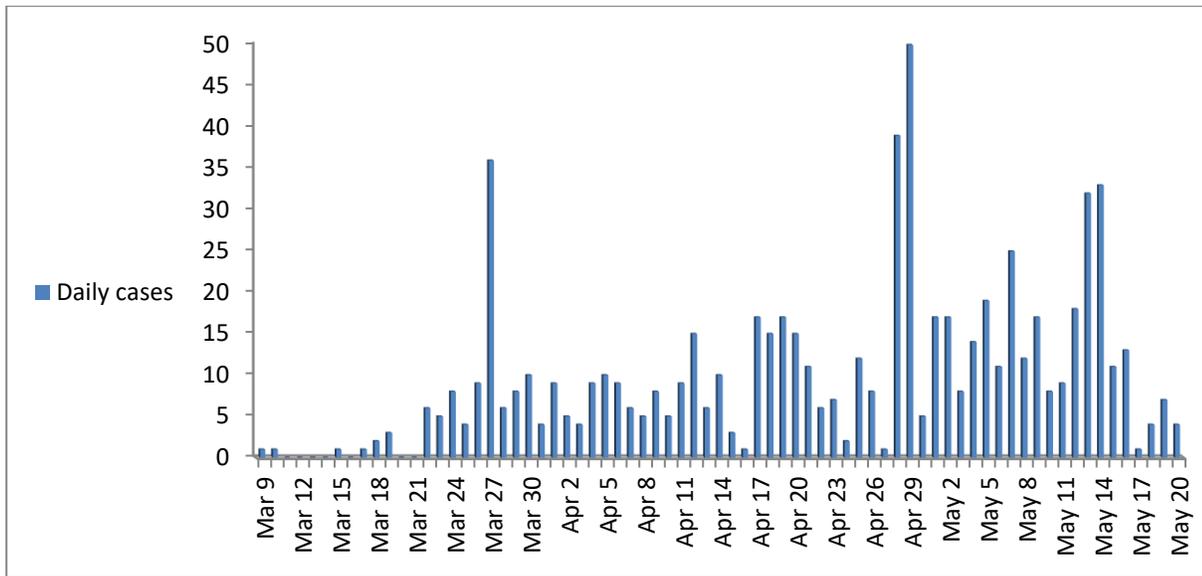


Fig 1. Daily reported cases of COVID-19 infection in Basrah province over the period from March 9 to May 20, 2020.

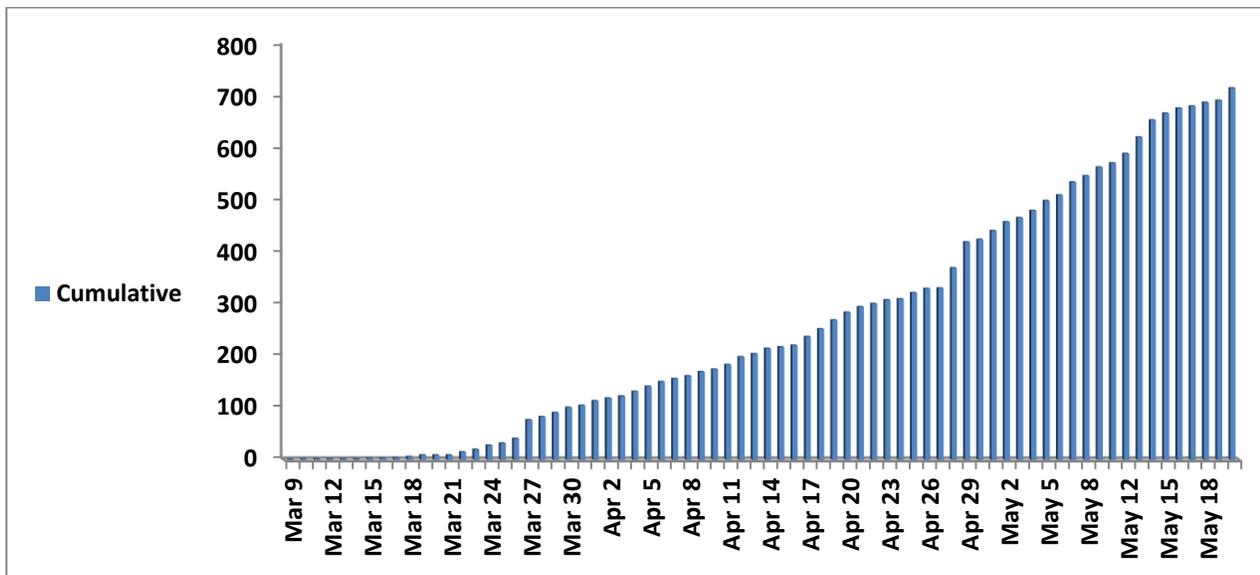


Fig 2. Cumulative cases of COVID-19 infection in Basrah province over the period from March 9 to May 20, 2020.

Discussion

The present article complements and builds on our previous publication on COVID-19 in Basrah.¹ It is important to state here that as the epidemic is still continuing, it is difficult to provide a complete picture of its features and outcome. However, adding more cases and including longer period of time had uncovered new insights about the dynamics of the epidemic in terms of demographic characteristics, geographical distribution and outcome indicators. In general the epidemic in Basrah is still moderate in intensity with characteristic fluctuations in daily reported cases. These fluctuations reflect the practice of active case detection among contacts of reported cases and the nature of cluster transmission of infection. The curve of cumulative cases is showing ascending trend but it is neither exponential nor leveled yet. The demographics of the cases in Basrah revealed two features; the mean and median ages are much lower than the corresponding figures reported in other studies outside Iraq as for example the studies in Singapore,¹³ China^{14, 15} and a higher proportion of children aged less than ten years (7.7% in Basrah compared to 0.9% in China¹⁴). The higher proportion of children among cases in Basrah is partly due to the fact that children represent about 40% of the general population,¹⁶ but also suggests that children are susceptible to COVID-19 infection.² The case fatality ratio for all cases was 2.4% and it seems within the range at the global situation.¹⁷⁻¹⁹ A fatal outcome was likely if the patient was of old age, with comorbidity and had travel history prior to the onset of the disease. This result was consistent in both univariate analysis and logistic regression. It is consistent with research from other parts of the world.^{17,20} The relative delay in

leveling and descending of the epidemic curve with time could be attributed to the misconception of the public about social distancing and the limited resources available for active case detection.²¹ Despite that, the exit from the COVID-19 epidemic is feasible given the low scale of apparent cases, the cluster nature of transmission and the informing situation in the country and at global level.

Conclusion

Despite the passage of almost nine weeks since the onset of COVID-19 infection in Basrah, the epidemic curve showed fluctuation with multiple peaks and no clear evidence that an exit is predictable in the coming foreseeable future. The inadequate coverage by testing and the misconception of people about social distancing are likely to keep the epidemic going on for some time in the foreseeable future. However, it is unlikely that the epidemic will escalate in exponential pattern provided that reasonable level of preventive measures is maintained.

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ديناميكية وباء كوفيد-19 في البصرة- تقرير 2

الخلفية: ما تزال جائحة كورونا تزداد انتشارا في العالم و مال زال الوباء معتدلا ومستمر في محافظة البصرة

الهدف: توسيع دائرة الوصف لوباء كورونا وتوثيق المتغيرات الوبائية لها في محافظة البصرة.

الطرائق: تمت الافادة من مصدرين للبيانات في هذا البحث. المصدر الأول هو قسم الصحة العامة في البصرة حيث تم استحصال ملف يحتوي بيانات ل 736 حالة تتعاقب العمر والنوع والسكن وتاريخ السفر ووجود امراض مزمنة ومصير الحالات. المصدر الثاني هو البيان الرسمي اليومي لوزارة الصحة حيث تعلن الاصابات الجديدة للمحافظات ولعموم العراق. تم استخدام بنام جي اكسل و الحزمة الاحصائية للعلوم الاجتماعية لغرض تحليل البيانات وعمل الاشكل التوضيحية.

النتائج: معظم المرضى في عمر الشباب حيث كان معدلا لعمر لعموم المرضى هو $18,9 \pm 35,5$ وهو متقارب لكل من الذكور والاناث.

اظهرت النتائج ان نسب الإصابة تزداد مع تقدم العمر وهي اعلى في مدينة البصرة وقضائيا الهارثة والمدينة مقارنة بالمناطق الاخرى، اما نسب الوفيات فتعتمد بشكل معتد احصائيا على تقدم العمر ووجود حالة سفر قبل الاصابة ووجود امراض مزمنة. أما المنحنى الوبائي الزماني في تميز بالاعتدال والتذبذب (التموج) ومن الصعب التنبؤ بالخروج من حالة الوباء بضوء المعطيات الحالية.

الاستنتاج: يتميز الوباء في البصرة بالاعتدال وانتشار البؤر في نمط العدوى وليس من اليسير التنبؤ بموعد قريب للخروج من الوباء

كلمات مفتاحية: : وباء كورونا، نسبة الوفيات، نسبة الاصابات المنحنى الوبائي