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IMPACT OF HYDROXYCHLOROQUIN/AZITHROMYCIN PROTOCOL ON COVID-19 CASE-FATALITY RATE REDUCTION IN ALGERIA

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ABSTRACT: *This study aimed to demonstrate the effectiveness of hydroxychloroquin/ azithromycin protocol in Algeria, in particular after its extension to all patients diagnosed COVID-19 positive on RT-PCR test. We were able to illustrate this fact graphically, but not to prove it statistically, indeed in the 7 days which followed generalization of therapeutic protocol, case fatality rate decrease and doubling time increase, thus confirming the impact of wide and early prescription of hydroxychloroquin/azithromycin protocol.*

KEYWORDS: Algeria, Covid-19, Pandemic, Hydroxychloroquin, Azithromycin, Case Fatality Rate.

INTRODUCTION

Covid-19 is an emerging infectious disease like viral zoonosis caused by new coronavirus SARS CoV 2.

On December 31, 2019, Wuhan Municipal Health Commission in Hubei province (China) reported cases of pneumonia, the origin of which is a new coronavirus.

Rapidly extendable around the world, the World Health Organization (WHO) declares it pandemic on March 11, 2020.

This pandemic reaches Algeria on February 25, 2020, date on which the Algerian minister of health, announced the first case of Covid-19, a foreign citizen.

From March 1, a cluster is formed in Blida and becomes the epicentre of the coronavirus epidemic in Algeria, its total quarantine is established on March 24, 2020, it will be smoothly alleviated on April 24.

A therapeutic protocol based on hydroxychloroquine and azithromycin was put in place on March 23, for complicated cases, it was extended to all the cases confirmed on April 06.

Patients and Method

We have analyzed the data collected from press releases and follow-ups published daily by the Ministry of Health, we have studied the possible correlations of these data with certain events or decisions having a possible impact on their development, such as confinement at home and its reduction, the prescription of hydroxychloroquine/azithromycin combination for serious patients and its extension to all positive COVID subjects. Results are presented in graphics, the data collection was closed on 26/05/2020.

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RESULTS

Covid-19 pandemic spreads from February 25, 2020, when a foreign citizen is tested positive, on March 1 a cluster is formed in the city of Blida where sixteen members of the same family are infected during a wedding party.

On 26/05/2020 :

Days of Pandemic	Cumulative Cases	Cumulative Deceased	CFR	DT (days)
92	8697	617	7,09 %	23

CFR (Case-fatality rate). DT (Doubling time).

Data from the Algerian Ministry of health

Wilaya of Blida becomes the epicentre of coronavirus epidemic in Algeria and lockdown measures taken, while the number of national cases diagnosed begins to increases (Figure1).

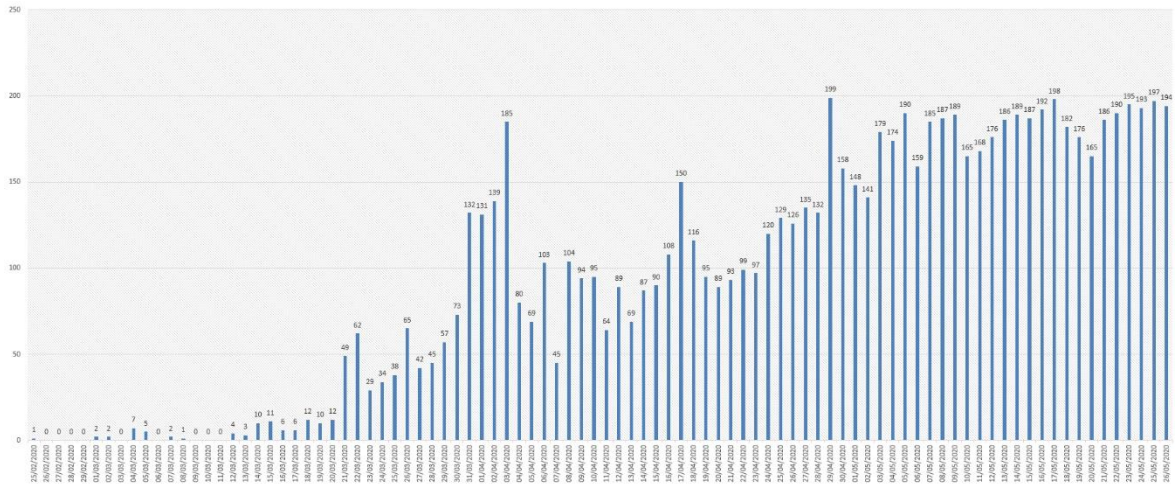

Figure 1: Daily New Cases of COVID 19 in Algeria

The rapid increase of cumulative cases in the country is shown in the following figure (Figure 2), the second curve corresponds to a cumulative number of deaths.

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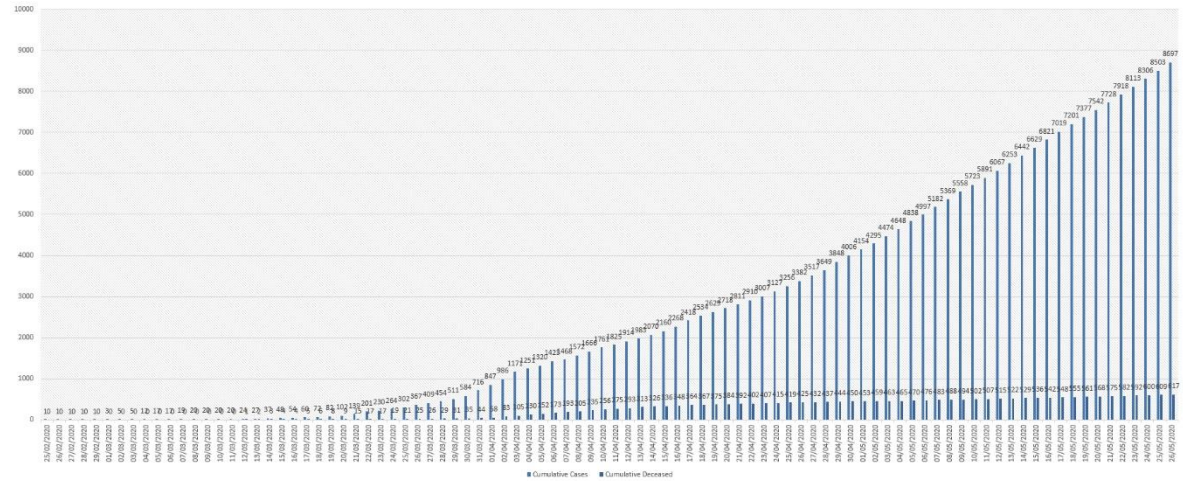

Figure 2: Cumulative COVID19 Cases and Deaths in Algeria

Case-Fatality rate curve evolves gradually from March 12, at the very beginning of the epidemic, it reaches 15.78% on April 13, then decreases gradually to be around 7,09 % on May 26 (Figure 3).

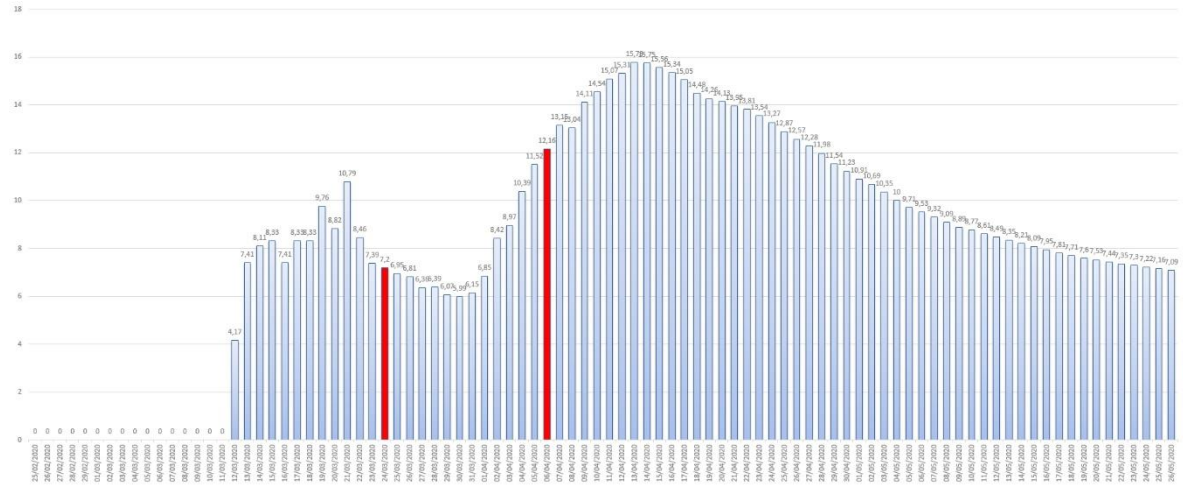

Figure 3: Case-Fatality Rate of COVID 19 in Algeria

First red markings: Introduction of hydroxychloroquin/azithromycin protocol (23/03).

Second red markings: Generalization to all positive cases (06/04).

Regarding the doubling time, it is in constant progression, first extremely fast at the start of the epidemic, it gradually decelerates to reach 23 days on May 26, (Figure 4).

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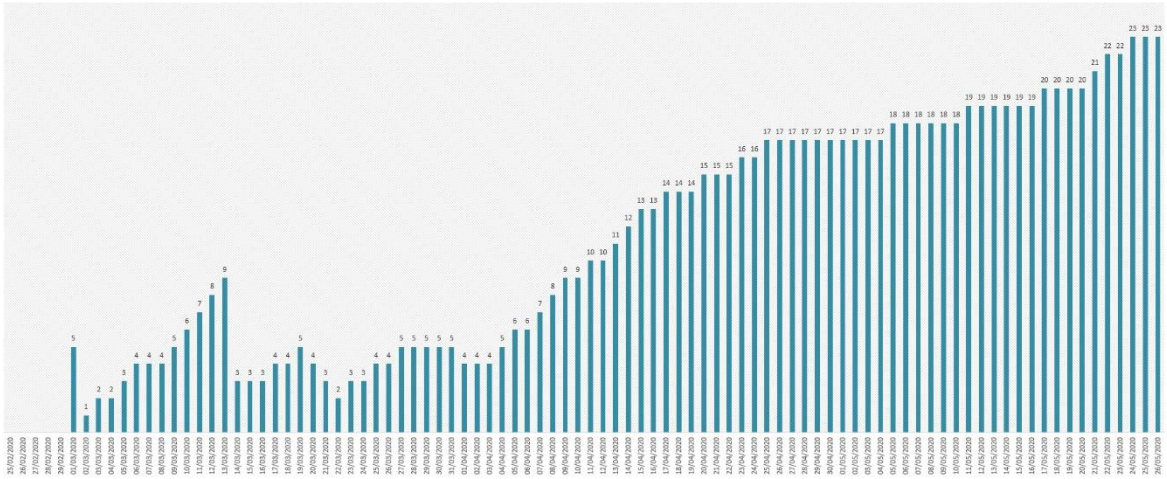

Figure 4: COVID 19 Doubling Time in Algeria

Their progressions being opposite, case-fatality rate and doubling rate curves cross twice, a first time, on 03/14/2020, when the epidemic is active and when it is moving towards its maximum, and a second time, around 20/04/2020, 7 days after the extended prescription of therapeutic protocol and stabilization of the epidemic (Figure 5).

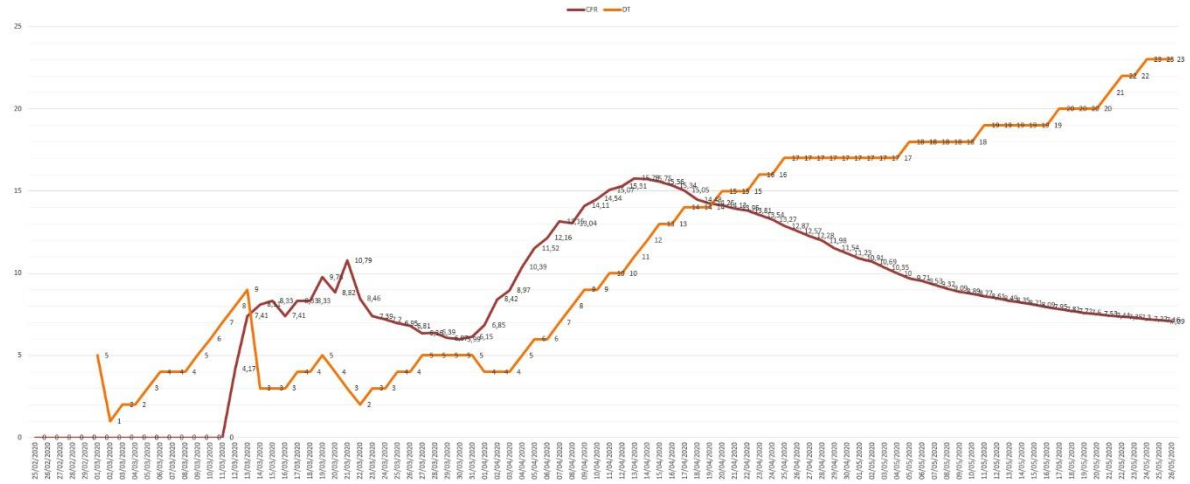

Figure 5: Evolution of Case Fatality Rate and Doubling Time in Algeria.

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ANALYSIS

In first the sustained increase in the number of diagnosed in Algeria seems to be linked to the increase in the capacity to carry out the RT-PCR test, indeed, for a moment limited to the Institut Pasteur in Algiers (IPA), this possibility was quickly extended to other cities with the creation of IPA annexes.

The different curves allow us to understand certain key elements in the progression of this epidemic in Algeria:

The case fatality rate: it is established from the number of positive cases and deceased persons, it is used to assess the mortality linked to Covid-19, in our analysis, it gradually decreases after generalization of the use of the therapeutic protocol, this progressive decline begins 7 days after generalization of therapeutic protocol, whereas when the treatment was reserved only for severe cases its impact was limited.

Doubling time: this is the time it takes for a population with COVID-19 to double its value, to measure it, we estimate the number of days it takes to double the number of people hospitalized.

Concerning Ro (basic reproduction rate), It is an index of the contagiousness of this disease[1], this doubling time is constantly slowing down in our study, it is currently around 23 days, it is a good indicator of the effective impact of the measures adopted.

The control of this doubling time could be done by actions on the three parameters of Ro[2]:

1. Reduction of the probability of transmission by hygiene and prophylaxis measures (handwashing, protective masks).
2. Reduction of the rate of contacts by reduction of social life (social distancing by closing places of worship, schools, universities, the suppression of public gatherings, the reduction of the circulation of the population).
3. The decrease in the duration of contagiousness (use of symptomatic drugs and isolation of contaminated subjects).

DISCUSSION

The lethality of COVID-19[3] is extremely versatile in the world[4], the difficulty of estimating the real number of carriers in the absence of systematic tests makes this figure highly variable according to the countries[5], it is more logical to analyze the daily evolution in each country[6], in particular when the therapeutic approaches are different[7].

In Algeria, the overall case fatality rate, first estimated at 15.78 % on 13 April, begin to decrease 7 days after generalization of therapeutic protocol, to reach 7,09 % on May 26, confirming the effectiveness of the measures taken and the merits of using hydroxychloroquin/azithromycin protocol.

This therapeutic protocol, although disputed[8], has largely proven its effectiveness since[9], both in terms of mortality and in the evolution of the disease[10].

Inexpensive, hydroxychloroquine has been widely prescribed worldwide for more than 70 years, it is known for its antiviral and anti-inflammatory effect[11], while azithromycin is an antibiotic from the macrolide family widely prescribed in respiratory conditions.

The establishment of home confinement[12] on March 24, when only 264 cases had been officially identified in Algeria resulted in the improvement of the doubling time, initially estimated between 1 and 4 days, it is progressively improved to around 23 days on 26/05/2020, comparatively, this decision to confine was taken in Italy when 9000 cases had been diagnosed (around 7000 cases in the United Kingdom and France)[13].

In any event, the association of early containment measures combined with a generalized initial treatment for all positive cases, whatever their degree of severity, will have contributed to a reduction in the fatality rate of COVID 19 and a slowing down of its doubling time.

CONCLUSION

In Algeria, the rapid combination of rigorous containment measure at home and early generalized treatment with hydroxychloroquin have demonstrated their effectiveness in terms of morbidity and mortality, the classic measures of social distancing and hygiene will make it possible to perpetuate these results by reducing viral transmission, the only unknown, the reopening procedure which can only be started after being surrounded by precautions aimed at ensuring the understanding of the population.

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