A Review on the Novel Coronavirus pandemic (COVID-19) in Bangladesh; Challenges and Initiatives.

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Abstract: Since the first coronavirus patient was identified in Bangladesh on March 8, the most controversial issue is about the exact level of the infection in Bangladesh. Conformly with the population density the number of COVID-19 tests is inadequate. As the number of tests increases, so does the number of infections, making it difficult to predict the spread of COVID-19 in Bangladesh. In this case, the unplanned initiatives are particularly responsible in other for unplanned measures, lack of public awareness, and lack of proper knowledge. In this case, the Ministry of Health has made three major mistakes, three important features of the medical system in Bangladesh have been mentioned. It is more effective to prevent COVID-19 by isolating the infected person by further testing COVID-19 until effective treatment is available and to provide adequate and effective masks and personal protective equipment (PPE). In this case, the COVID-19 testing kit invention has received a good response in many countries of the world. This study focuses on the comprehensive data verification, selection, and evaluation of COVID-19 in Bangladesh and its implications for the future, what to do to address and prevent the COVID-19 challenge, and effective treatment against the coronavirus (COVID-19). It is hopeful that the discussion of the material mentioned in this research paper will help to strike a balance between the government, citizens, and experts which will be feasible in improving the current situation in COVID-19 Bangladesh and reducing its severity.

Keywords: COVID-19, Bangladesh, Challenges, Initiatives, Controversial issue

Introduction

Respiratory distress infections were registered first to the WHO office on 31 December, 2020 in Wuhan, Hubei Province , China, which later spread to China as an epidemic (1).On January 7, 2020, the Chinese Center for Disease Control and Prevention (CCDCP) named the disease Acute Respiratory Syndrome as Coronavirus 2 (SARS-CoV-2) and the World Health Organization (WHO) as COVID-19(2).During the Chinese Spring Festival on January 23, public transport was suspended in Wuhan and all cities in Hubei Province due to large crowds lowering the social sharing threat(3). With the gradual expansion of COVID-19, professional sensitivities, guidelines, and standards were established to facilitate infection prevention, diagnosis, and treatment (4).

In December 2019, the first case has been registered, and from December 18, 2019 to December 29, 2019, one in five patients admitted to the hospital with acute respiratory infection syndrome died (5,6). Some features of the COVID-19 virus are not yet fully known, and among the objected patients, COVID-19 was newly found in saliva(7).

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Progress can hardly be forecastof economic anxiety and to evaluate its underlying mechanisms in the context of an epidemic when relying on historical accounts(8).The COVID-19 epidemic caused a greater uncertainty than the financial crisis of 2008-09 and is more similar to 1929-1933(9).Individual livelihoods, business, industry and the entire economy are likely to collapse due to COVID-19(10) .Chinese markets have also begun to rebound, with U.S. markets reaching new highs after initial sales closed at the end of January for COVID-19(11).Techniques in South Korea appear somewhat more restrictive than in order(12). More than 20.5 million Americans applied for unemployment insurance in April, that all-time record and the highest national unemployment monthly rate since 1948, at 14.7% (13). Bangladesh Bureau of Statistics (BBS), the researchers have run simulations which reveal that with a negative income shock of 25%, the overall poverty rate will be 40.9%, which means another 20.4% population will fall into poverty (14).In this situation, in developing countries like Bangladesh, the coronavirus can be a threat to the economy (15).

Different opinions have been expressed in different countries about the prevalence of COVID-19 (16). In this paper, we show the coronavirus outbreak situation in Bangladesh on the comprehensive data verification, selection, and evaluation of COVID-19 in Bangladesh and its implications for the future, what to do to address and prevent the COVID-19 challenge, and effective treatment against the coronavirus (COVID-19).

Review,andcomparison and feedback of overall data of Covid-19 in Bangladesh:

The number of people infected and dying from the coronavirus epidemic is constantly increasing worldwide. Because, COVID-19is a direct propagation from human to human by forward touch and by droplets in the air(17).Fever, cough and tiredness are the most common signs of early COVID-19 disease and other signs include sputum generation, headache, hemoptysis, vomiting, dyspnea and lymphopenia (18).Table-1 provide various data to compare the overall situation of coronavirus in Bangladesh and other countries in South Asia and Fig-1 data have been provided to review the current overall situation of COVID-19 countries with more coronavirus attacks in the world along with Bangladesh.

Here in Table-1 it is seen that the South Asian country of Maldives has the highest number of infected 5483 people per million population and the second highest number is 1241 in Bangladesh and the lowest is 113 in Bhutan and also added that Afghanistan has the highest number of total death 30 people per million of population and the 5th highest number is 16 in Bangladesh and the lowest is zero in Bhutan. A comparison of Bangladesh with South Asian countries in Fig-1 also shows that Bangladesh has the second lowest of total COVID-19 test 6241 per million of the total population and the lowest 1241 in Afghanistan. Since the number of coronavirus testing is very low compared to the total population in Bangladesh, the average amount of death and amountof infections per one million population is significantly higher than in South Asian countries. Full amount of recuperation in Bangladesh is 111642 which is satisfactory though it is not possible to consider the situation of overall COVID-19 of a country with the amount of recuperation. India has the highest amount of active cases among South Asian countries and Bangladesh is in the second position at 90275. In India, the critical number is 6944, which is very worrying.

received data on July 19	Total cases /1 M Pop.	Total death /1 M Pop.	Total test /1 M Pop.	Total recovered	Active cases	Serious critical

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Afghanistan	910	30	2,150	23,634	10660	31
Bangladesh	**1241**	**16**	**6,241**	**11642**	**90265**	**1**
Bhutan	113	0	52,202	80	7	0
Maldives	5,483	28	124,344	2,362	589	12
Nepal	606	1	21,536	11,695	5,923	0
India	810	20	9,989	700,399	390205	8,944
Pakistan	1,192	25	7,788	204,276	53,652	1,763
Sri Lanka	127	0.5	6,327	2,035	678	1

Table-1: The latest situation of COVID-19 in South Asian countries till June 26 (19).

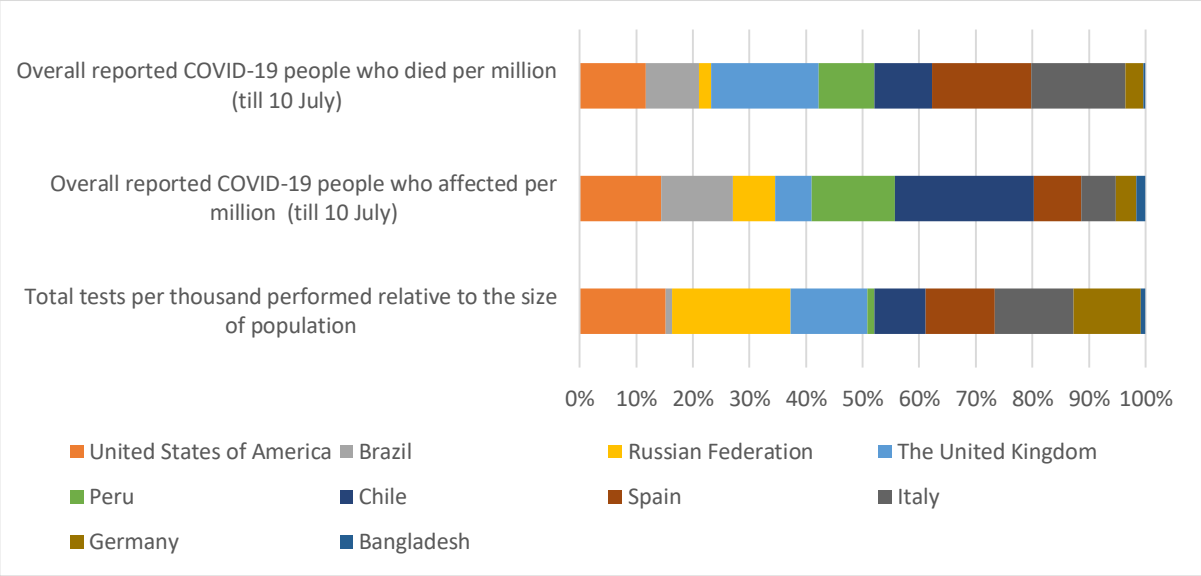

Fig-1: Data for review of the current COVID-19 overall situation of countries with more coronavirus attacks in the world with Bangladesh (20)

Fig-1 shows that compared to the total population of COVID-19, the percentage of Tests per thousand is the lowest in Bangladesh at 5.51 and Brazil is in the second position at 6.96. Since the number of COVID-19 tests in Bangladesh is much less than other countries, the total confirmed cases and overall reported COVID-19 people who died per million people are less than 1,065.61 and 13.59 respectively.

The incidence of COVID-19 in Bangladesh in Fig-3 is much higher than in South Asia and around The World, but the mortality rate is slightly lower. In Fig-2 gives an idea of the total number of deaths from coronavirus infection in the world every 10 days from January 21 to June 19 and indicates the time of the highest number of deaths.

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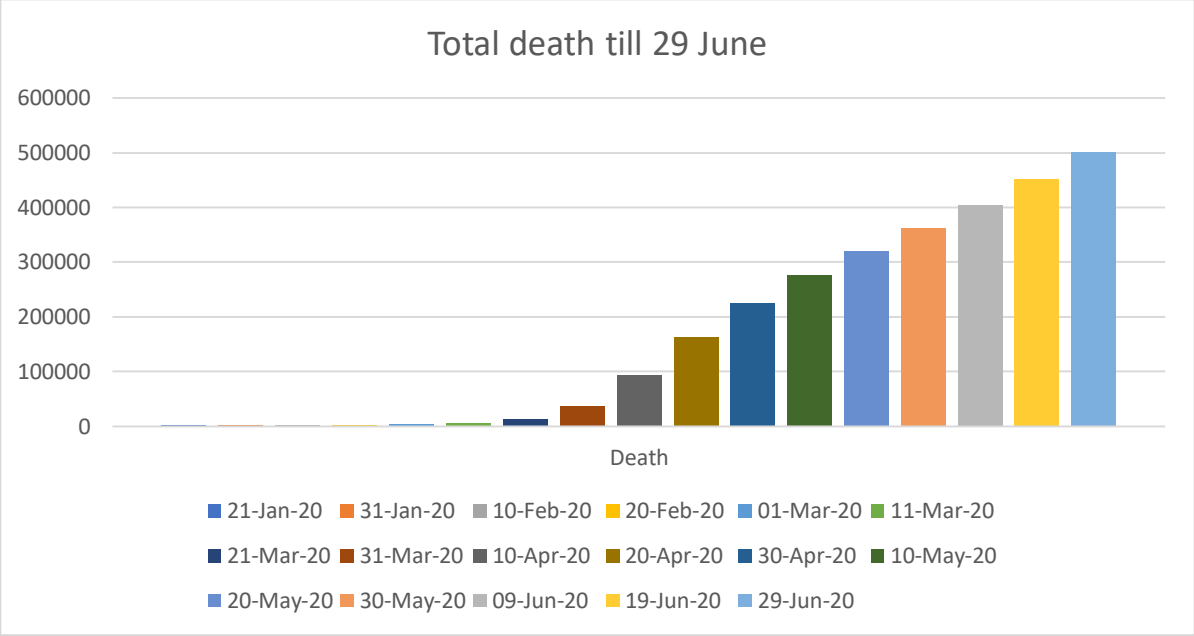

Fig-2: Bar chart for death COVID-19 people from 21 January to 29 June in the world (21).

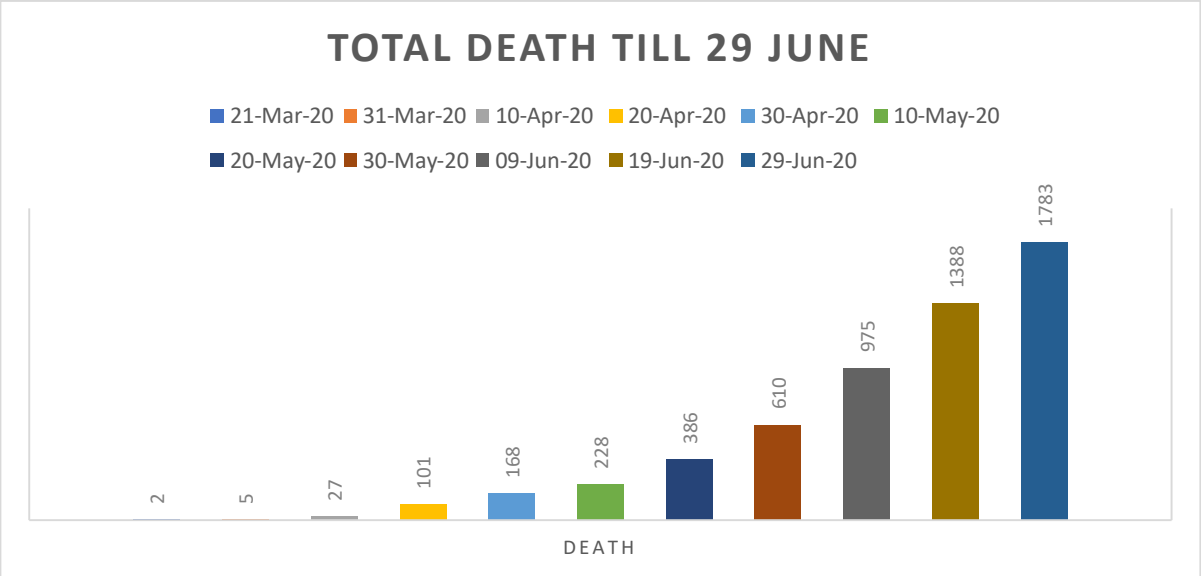

Fig-3: Bar chart for death COVID-19 people from 18 March to 29 June in Bangladesh (22).

Data from Fig-3 are taken from the Pathology Disease Control and Research (IEDCR) website. Fig–4 gives an idea of the total number of deaths from coronavirus infection in the world every 10 days from 18th March to June 29th and indicates the time of the highest number of deaths. From this chart it can be inferred that the death rate due to coronavirus in Bangladesh is less than in other developed countries of the world but the infection is increasing day by day. The United Nations has called on South Korea to follow in South Korea's footsteps in dealing with the epidemic and also called South Korea's move a "green deal" (23).

As of 18th July, according to Institute of Epidemiology, Disease Control and Research (IEDCR) of Bangladesh whole**1,028,299** samples were tested and **204,525** were infected**, 2,618** were death and **111,644** were recovered (24). The information provides infection rate is

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19.8%, recovery rate is 54.58%, and mortality rate is 1.28%. As of 30th June 2020, according to Bangladesh Medical Association (BMA),total 5690 doctors, nurses and health workers have been affected by coronavirus (COVID-19), including 1995 doctors, 1536 nurses and 2159 other health workers and most of the health workers including doctors, nurses and staff are affected by coronavirus due to low quality masks and Personal Protecting Equipment (PPE) (25). If the total number of infection in coronavirus in Bangladesh 204,525 and only doctor is about 1995 till 18th July then the rate of infection among doctors is **0.975**% (25,26).

Division	Affected of Doctor	Percentage
Dhaka	993	49.65
Chittagong	420	21
Sylhet	192	9.6
Mymensingh	149	7.45
Khulna	95	4.75
Rangpur	67	3.35
Barisal	50	2.5
Rajshahi	29	1.45
	Total:1995	

Table-2: Percentage of doctors in Bangladesh according to the Division (25).

From Table-2, the data is extremely sad and dangerous because the condition of the affected patients is more deplorable if the condition of the doctors in such. Bangladesh having only one doctor for every 1847 peoples medical treatment, although the government is trying to deal with it efficiently (27).

In the present situation of coronavirus in Bangladesh

On 5 April Bangladesh reported 18 new cases, an increase of 26 percent over the previous day and an increase of 20 percent over the day to the present, which is a sharp rise in cases (28). Bangladesh crosses the figure of 100 confirmed cases on 6th April, 1,000 confirmed cases on 14th April, 10000 confirmed cases on 3th May, 25000 confirmed cases on 18th May, 50000 confirmed cases on 1th June,75000 confirmed cases on 11th June and 100000 confirmed cases on 18th June (29).

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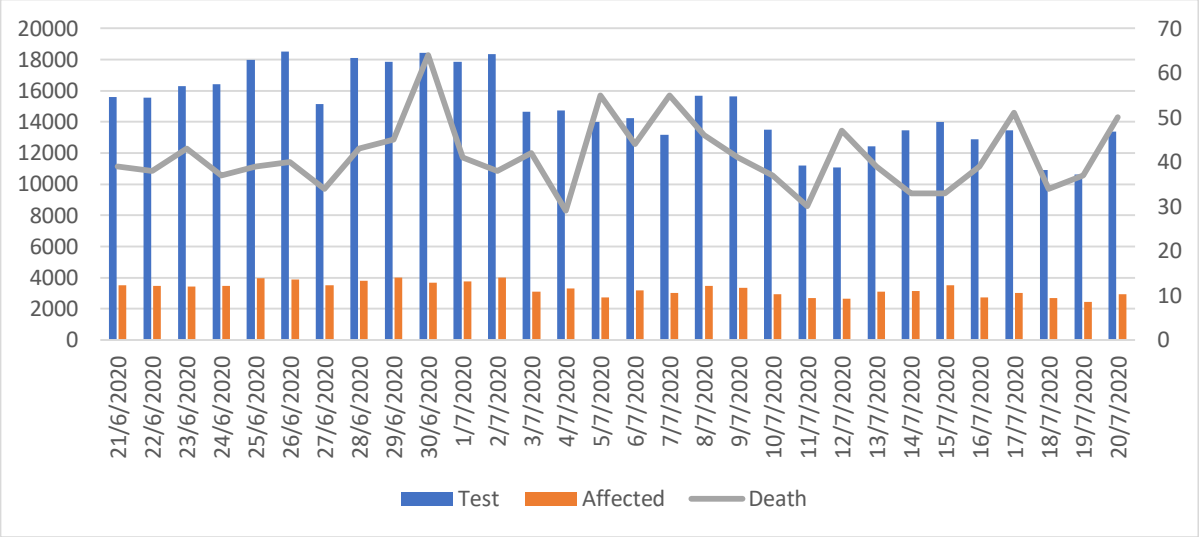

Fig-4: From 21 June to 20 July, till the number of daily COVID-19 tests, infections and death in Bangladesh is arranged (30).

Fig-4 shows that with the increase of COVID-19 test for 30 days from 21 June to 20 July, the number of infected people is increasing at a very proportional rate. The rate at which tests are being conducted every day is not enough and it is not a picture of the whole country. The death toll is not commensurate with the amount of COVID-19 tested andtainted, but the number of deaths in the last one month was between a minimum of 29 and a maximum of 74. The country is still not at the peak of transition. If the number of tests is increased and the general holidays are also increased the situation may become going for the better. If not, the highest number of deaths and patients will be seen quickly. Imperial College London reported that Bangladesh's top will die as many as 10,000 in a single day in September and October but government action could reduce it (31).

Activities and preparation of medical system in Bangladesh:

In Bangladesh the highest mortality rate of doctors in the world (32). Doctors are seeing this condition as worrying. The overall mismanagement of the health sector is becoming more evident especially at this time. In this situation, a new plan is needed to give proper protection to the front-line fighters. Because physicians need to play a responsible role in dealing with the current crisis for coronavirus, as well as build trust by ensuring the necessary benefits.

Statistically, it is 14 percent. It is important to understand that the situation is alarming and that the actual data needs to be verified through extensive testing (33). Till now The Ministry of Health of Bangladesh could not take any effective steps to deal with corona properly. The mistakes that the Ministry of Health is making include-

First; The Ministry of Health has not taken any plan to increase the number of coronavirus testing. Because the number of tests is being increases as the number of patients increases (34). If this situation continues, the health system will be at greater risk instead of preventing the coronavirus.

Secondly; The Ministry of Health has not been able to set up a separate hospital to treat patients infected with the coronavirus, which is why private hospitals are becoming at risk (35). If such a situation arises, it is feared that the citizens of this country will lose their last resort to get the minimum treatment.

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Third; The healthcare workers have been suffering from a crisis of medical supplies and food. The masks provided at these centre are not N95 or equivalent masks (36).

The Department of Health in United States of America(USA) is giving wrong information about the rate of coronavirus infection, death and recovery in the country (37). If as the same, Bangladesh will go to enter a complicated situation in dealing with Corona and every step is forgotten. From which the path of liberation is very difficult and it may cost a lot.

Since the COVID-19 infection in Bangladesh, health workers have been the mostly affected. Situation has brought panic among the doctors and the doctors are raising the issue of their safety. Bangladesh has not yet made such preparations as there is an alternative team in all countries. As a result, if more physicians are infected, health workers and physicians may not be found to provide treatment.

Three important features of the medical system in Bangladesh:

First, a large part of our medical system is dependent on private hospitals, and private hospitals cover large of our total medical system (38). There have been frequent complaints of patients being turned away from various hospitals after the onset of COVID-19 infection (39). However, analysis of various data large proportion are met through treatment abroad (40). Concerns continue over the state of the private medical system in the wake of the coronavirus epidemic in Bangladesh. As a result, medical care is in crisis.

Second, private hospitals in Bangladesh are not treating people properly because people will come to private hospitals for corona tests if they have minor symptoms, which will increase the risk of infection in private hospitals. As a result, coronavirus infections may increase in private hospitals.

Third, ordinary people go to private hospitals to hide their symptoms of shortness of breath and other symptoms of coronavirus and talk about heart disease and difficulty in breathing. That is why there is a terrible risk of corona infection. This is creating mistrust of the patients with the health workers. If this continues, all kinds of treatment can be stopped.

To protect coronavirus (COVID-19) in the perspective of Bangladesh it should,

1. It is advisable to isolate confirmed or suspected cases with mild illness at home (41). Restricting propagation between human and human is essential to prevent the spread of infection and to reduce secondary infections among healthcare workers and to prevent further spread from China (42).
2. Ensure that all doctors, nurses and health workers working at the entrance of Non COVID-19 Hospital are provided with suitable PPE, N-95 or equivalent masks by introducing Triage System with shortest possible time.
3. Emergency medicine departments need to be strengthened to implement strict hygienic measures to control infection prevention(1). Accommodation of doctors, nurses and other

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health workers working in all public and private hospitals, provision of necessary food and transportation to the hospital.
4.
(I) Listing of essentials, marketing by calculation and social distance must be maintained during this time.
(II) Masks and gloves should be worn and disinfected using soap and water if necessary.
(III) Disinfectant and shoes at the entrance of the house. Precautions for use
(IV) Stay away from other family members, it should be strictly adhered to until completely disinfected.
(V) The standard rule for hand washing is to wash hands with soap and water for at least 20 seconds, and if soap and water are not procurable, use disinfectant of alcohol with at least 60% alcohol (43).
(Vi) Market bags or packets of soap and water or disinfect water detail.

Public Health Invented 'GR COVID-19 Rapid. Bolt Immunity' Kit for coronavirus (COVID-19):

The test kit 'GR COVID-19 dot blot' developed by the **Gonoshasthaya Kendra's** can be used to identify antigen-antibodies at the same time, said the chief microbiologist of the team who invented the kit. Bijon Kumar Sheel(44). Once the virus enters the human body, within minutes the body's immune system interferes with its innate response by helping granulocytes, scavenger cells, and blood and lymphatic system killer cells to fight the virus (45). The treatment given to the patient drops the immune system in the body of the infected person, so it is too late for the immune system to come. If it is positive, the antibody will be positive (46).

The kit uses the Rapid Blot-Dot technique to detect coronavirus positive cases within 15 minutes(44). Public health kits are tested from blood samples. A drop of blood serum 'GR COVID-19 dot blot' in a rapid testing kit will give a specific color(47). The technique looks for antibodies created in the body in response to the virus infection (48). It can be seen together in a public health kit, antigen, antibody and possible to identify 70% of the patients who have had COVID-19 disease before (49). Gonoshasthaya Kendra's founder and trustee Dr.Zafrullah Chowdhury, who tested COVID-19 positive according to the organisation's newly developed Rapid Dot Blot test, has been receiving plasma therapy by taking 200 millilitre serum from a recovered COVID-19 patient on 26 May Tuesday afternoonandfound that his body is developing some antibodies (50).
Public health invented coronavirus 'GR COVID-19 Rapid Dot Bolt Immunity' kit has not yet been approved testing as the Ministry of Health because,"70 percent of patients who have previously had COVID-19 disease can be identified" said Bangabandhu Sheikh Mujib Medical University (BSMMU) (51).

Despite its importance in many countries around the world, no government agency or the Department of Drug Administration went to the Gonoshasthaya Kendra to receive the kit, except Centres for Disease Control and Prevention (CDC), a US-based research institute for coronavirus detection (52).

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In consultation with the World Health Organization on the importance of coronavirus identification. Extensively tested, the importance of the 'GR COVID-19 dot blot' kit invented by the public health centre is immense. The best part of this rapid kit is it's cheap (approximately $ 3) to produce unlike the RT-PCR testing kit which one is expensive costs about $ 120 to $ 130 (44).

Source: The rapid COVID-19 test kit developed by Gonoshasthya Kendra RajibDhar/Dhaka Tribune(49).

Dr.Zafrullah Chowdhury said the European Union had shown interest in importing their kits(53). GonoshasthayaRNA Biotech Limited, a subsidiary of Gonoshasthaya Kendra, with the help of experts from Singapore, invented the kit called "GonoshasthayaRapid.blot"(54).

Various drugs and medical systems that are being used for COVID-19 treatment in Bangladesh and some of which are being researched:

Since COVID-19 is currently being used as a symptomatic and supportive care until any standard and hundred percent effective treatment, efforts are being made to prevent vital symptoms as much as possible (e.g., oxygen saturation and blood pressure) and to treat complications (e.g., minor infections or organ failure) (55). There are a number of antiviral drugs and treatments that have been found in the world that are not completely effective, but they are used to prevent COVID-19. Favipiravir, Remdesivir, Hydroxychloroquine, Lopinavir-Ritonavir and Ribavirin are some of them (56). Most COVID-19 patients took antiviral therapy in China (57).To prevent the symptoms and cause of death of COVID-19, a number of potential experimental treatments are underway,

Ivermectin and Doxycycline:

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Bangladeshi doctors Bangladesh Medical College Hospital (BMCH) Professor Dr Md Tarek Alam claim to have found effective drugs used antiprotozoal medicine called Ivermectin in a single dose with Doxycycline yielded miraculous result in curing his patients with COVID-19 treatment (58). In all 120 cases, their oxygen needs decreased and they returned home within two to three days (59).

Ivermectin:

Ivermectin an Food and Drug Administration(FDA) authorized anti parasitic and antiviral activity in vitro is an inhibitor of the causative virus (SARS-CoV-2) (60). Over the next 24-48 hours Ivermectin is regulate virus transcript and it stopped the SARS-CoV-2 virus growing in cell culture (61). The key explanation for a single dose is to eliminate all viral RNA by 48 hours and that there was a substantial decrease even at 24 hours (62). People diagnosed with COVID-19 will consider a multiple supplemental dosing protocol under the latest permitted use of Ivermectin after clinical trials with Ivermectin(63). Ivermectin is an anti-parasitic medication authorized by the U.S. Food and Drug Administration that has also been shown to be impactful in vitro against a wide variety of viruses involving HIV, Dengue, Influenza and Zika in periods when we are facing a global pandemic and no authorized treatment is available (64). Ivermectin is an emerging oral antiscabietic that is as safe and effective as the topical (65). It should be given as a single dose (no. of 6 mg tablet 2) with a full glass of water (240ml) on an empty stomach (1 hour before breakfast) (66) .Common side effects are nausea, vomiting, diarrhoea, muscle or joint pain, fever, tiredness, itching, eye redness (66,67). At present this medicine is being given to people above 18 years of age. In Bangladesh, Delta Pharmaceuticals Limited manufactures and markets Ivermectin BP 6 mg / tablet called Sacabo 6 and Beximco Pharmaceuticals Limited Ivera 6or12, Popular Pharmaceuticals Limited Imec 6 etc. are existed (68). Invermectin is very good news for garment workers in Bangladesh and for people suffering from lower middle class coronavirus (COVID-19) in this country, because Delta Pharmaceuticals' Scabo 6 requires only 5 taka each, along with paracetamol in case of fever and Implex of Azithromycin in case of heart disease which within reach (69,70).

Plasma therapy (CP):

Convalescent plasma obtained from patients retrieved (or survivors) to patients with COVID-19 retain incineration antibodies against COVID-19(71).While the problem remains to be addressed with a conclusive treatment or vaccine for this lethal viral infection, an experimental study relating to the treatment of convalescent plasma (CP) arises as an array of light for the battle against SARS-CoV-2 infection (72).Convalescent plasma (CP) medication or hyper immune globin therapy has already been handed-down in Germany, France, the USA, Iran as well as many other nations around the globe to handle COVID-19(12).Convalescent plasma treatment is more authoritative than intenseequilibriumof hormonal knock in patients with SARS, attempting to reduce death rates and inpatient condition(73). In comparison, a number of studies showed a shorter hospitalization and a lower mortality rate of patients consuming convalescent plasma than people undergoing plasma treatment (74–76). A limited study of MERS transit indicated that the neutralizing antibody titrate would achieve 1:80 for effective medication with CP and the first major

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explanation is CP-reduced clinical therapy and neutralization (77). Since both SARS-CoV and the same SARS-CoV-2 sequence of sick persons i.e. patients have both high scalability and virological homology, the treatment of the badly affected COVID-19 patients may be convincing for CP therapy (60,78). In patients with 36 mo post-sickness disease, unique neutralized antibodies were degraded 4 mo slowly, reaching undetectable levels in 25.6% (IgG) and 16.1% (neutralizing antibodies) (79). A MERS-CoV analysis revealed a very small (2.7percent) prevalence of MERS-CoV IgG seroreactivity, where the antibodies titter rapidly decreased within 3 mo and exposed healthcare staff and patients were also exported (80). For this procedure, around one litre of plasma will be collected, where approximately only 250 mL of plasma is required for one patient (81). COVID-19 sufferers should receive ABO-Convalescent Plasma advancement consistent (200 mL on every stages)over a period of at least 30 minutes (82). Researchers found that patients were negative in the SARS-CoV-2 nucleic acid analyze after the introduction of CP therapy, increased oxygen saturation and lymphocytic counts and also enhanced organ function (83).We can say that convalescent plasma therapy may be an effective therapy to improve the clinical outcomes of COVID-19 patients.

Remdesivir:

The United States first drug discovery led to the use of Remdesivir as a 'unique pharmaceutical' and China took immediate measures to put Remdesivir in clinical trials and use it in therapeutic coronavirus (COVID-19) therapy (84). Bangladesh has become the first country in the world to sell a generic version of Remdesivirfor the treatment of COVID-19(85).Remdesivir clearly shows promise in combating new coronavirus, has been authorized for emergency use in the United States, but Remdesivir is a expensive medication and many argue that people usually cannot afford to get BeximcoRemdesivir free from these Govt. hospitals in Bangladesh (86). Admitted hospitalized adults, including COVID-19, had better recovery times and reduced Remdesivir placebo as evidence of lower respiratory tract infections (87). Remdesivir has demonstrated therapeutic and prophylactic effectiveness in nonclinical coronavirus models and has broad spectrum activity against filoviruses (e.g., Ebola) and coronaviruses (e.g., SARS-CoV and Middle East respiratory syndrome coronavirus [MERS-CoV]) (88).

Conclusion:

The main goal now is to prevent the COVID-19 situation crisis in Bangladesh and the government needs to be stricter and responsible the people need to be reminded to prohibit the spread of the infection. The scope of COVID-19 test needs to be further enhanced by ensuring public health services, adherence to social distances, adequate and quality regular PPE supply to Corona-facing veteran doctors, compliance with home quarantine, planned measures with strict maintenance, planned measures and proper knowledge of COVID-19. Growth, use of experience and corruption must be strictly suppressed. Above all, by properly balancing the government, citizens and experts, it will be able to mitigate the situation by building resistance against the deadly virus.

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