Dengue Protection and Cure: Bangladesh Perspective

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ABSTRACT

Up to 50-100 million infections are now estimated to occur annually in over 100 endemic countries, putting almost half of the world’s population at risk. Bangladesh is one of the countries that are affected by dengue viruses. Dengue is a viral infection caused by four types of viruses (DENV-1, DENV-2, DENV-3, DENV-4) belonging to the Flaviviridae family. These mosquitoes thrive in areas with standing water, including puddles, water tanks, containers and old tires. Lack of reliable sanitation and regular garbage collection also contribute to the spread of the mosquitoes. The disease has probably been known since the Chinese described it in 420 AD. Outbreaks are increasing although there is no human-to-human transfer, only mosquito-to-human viral transfer. Africans described “ka dinga pepo” as cramp-like seizure caused by an evil spirit. The Spanish may have changed “dinga” to dengue since it means fastidious or careful in Spanish, which describes the gait of people trying to reduce the pain of walking. With the number of patients rising, hospitals outside Dhaka are facing huge challenges to cope with the pressure, mostly due to lack of diagnosis chemicals, kits and other medical support.

Keywords: Dengue protection; topical essential oils; misconceptions with Dengue; Dengue vaccines; mosquito repellents; neem oil

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Introduction
The proof of the utilization of plants for medicinal purposes dates as far back as 60,000 years prior. As of late, the WHO assessed that 80% of people overall depend on natural medications for certain parts of their essential healthcare needs. Among 250,000 to 500,000 types of plants on earth, 35000 are utilized worldwide for medicinal purposes, 20000 medicinal plants are accessible in Indian subcontinent, somewhere in the range of 3000 have demonstrated potential in malignancy, 1200 in diabetes and 2000 in nuisance control programs. Around the world, mosquitoes transmit sickness to in excess of 700 million people [1]. Among them, 390 million were influenced with dengue consistently before 2013 and roughly 3.9 billion people live in dengue endemic nations. 2.4 million people are tainted with dengue every year in Bangladesh. After chikungunya flare-up, 2008-2017 in Bangladesh, the adrenaline junkie mosquitoes have made a loathsomeness circumstance with dengue fever. In excess of 50000 tainted in August alone [2] and a few people around continue saying that god-like is rebuffing people like he rebuffed Nomrud, the most dominant lord of his time, who was crushed by one frail mosquito. Reality is, we are still need behind real measures.

Discussion and conclusion
The first licensed dengue vaccine, Dengvaxia® (Sanofi), received regulatory approval in a number of countries but had some limitations [3]. Costs of 2 other live-attenuated vaccine candidates, DENVax (Japan) and TV003/TV005 (US) are not within the range of average people. In Indonesia Dengvaxia® costs about US$207 for the recommended three doses [4]. Some available mosquito repellent creams are hiking 10 times price than actual price, so how much Dengvaxia® will hike, if available, we can very well imagine. And which mosquito borne disease will be epidemic next time is uncertain. So, we have to focus on mosquito bite prevention, not dengue or chikungunya.

Climate change is a very important factor of Flavivirus (genus type of dengue virus) transmission but not the sole factor. Along with climate change, aberrant use of pesticides and their resistance is also noted in recent dengue affected countries. Most commonly used insecticides in households (metafluthrin & D-allethrin), mosquito coils repel mosquito and kerosene fog by city corporation kills larvae and ensures effective adult mosquito eradication for short-term. The use of coil protective stands is necessary to prevent fire incident and accidental touch. Mosquito proof nets are applied in many household and air blower in a few supermarket entrances are not enough for disease prevention and mostly unaffordable/unsuitable for general use. Full-sleeve cloths can reduce mosquito bite incidents but rarely ensures prevention from mosquito transmitted viral diseases. Permethrin/malathion-treated military clothing has shown to be effective in significantly reducing mosquito bites in the covered regions [6]. There is also an abundance of fixed or moveable electric devices (for example mosquito bats or electric coils) and wearable devices that are available, including: bracelets, sonic devices, clothing, and skin patches. Their accessibility, availability, affordability and practical uses varied among general people.

There are a few common misconceptions like garlic and coconut oil are effective repellents. Topical application of garlic oil and garlic consumption with vitamin B supplements have not been shown to be effective at repelling mosquitoes. But garlic essential oil can be an effective pesticide against mosquitoes when microencapsulated and used in an attractive toxic sugar baits system [7]. Many fake herbal or homeopathic liver tonics are available in the market claiming improved platelet count after use. A common tale told by people “burning one mosquito coil in a closed room amounts to smoking roughly 100 cigarettes” has little
scientific value. It's true that a burning coil has health effect but it's better than having deadly mosquito bites. The key message should be to avoid prolonged exposure, especially in enclosed spaces. Some smokers give it a reason that smoking prevents mosquito bites. A few smokers give it a reason that smoking counteracts mosquito nibbles. People with large body surface, pregnant women, infants and youths (age underneath 20) generally draw in mosquitoes because of their inclination to emit more carbon dioxide [8]. Likewise, alcoholic blood and blood group "O" attracts mosquitoes [9,10]. The effect of smoking on platelet count is still controversial. Aedes aegypti mosquitoes (the main vector of dengue) are known to bite during the daytime hours [11]. It does not spare use of mosquito-nets during night-time sleep in this hot and humid weather, rather encourage use of the same during daytime sleeping. Parks and lakes are where people get mosquito bites frequently. It is better walking/running there and leave the place soon after finishing walk avoiding idle sitting back and gossip. Since platelet count is compromised, conventional painkillers other than paracetamol should be avoided strictly because of their negative impression on platelet count [12].

Present Dengue Epidemic Situation

Around 3500 dengue patients are taking service of public/private hospitals around the country with more than 500-700 patients taking admission everyday [13]. Between August 12 and 18, at least 12,000 dengue patients were admitted to different hospitals across the country-- 6,866 of them outside Dhaka [14]. The situation was even worse in July-August, 2019. Hospitals were struggling with the patients. Number of dengue patients are 18-year high; 10,528 infected till July 27, 2019 [15] and more around 51,000 dengue patients hospitalized in August only [16]. 1,712 more people were hospitalized with the mosquito-borne virus in 31st July, 2019. Of them, 1,150 dengue cases were reported in the capital alone [17]. However, public awareness is the best initiative against dengue. Household wastes are the larval habitats of dengue vector. City corporation has taken initiatives to penalize households and offices with poor waste management and arranged kerosene fog spray once in a week but seems a half-hearted shot.

Recommendation

If we go back to plant derived mosquito repellents, we have a few options for topical use. Topical application of neem, lemongrass, peppermint and eucalyptus oil have equivalent efficacy of DEET (banned in Denmark, EU, US, UAE, Canada but available in Bangladesh) but relatively safe in use [18-23]. Conventional topical cream diethyl benzamide (ODOMOS/TRIG) also shows significant dermal and neurotoxicity [24]. Their use should be limited to feet and ankles [25,26]. Burning neem leaves provided nearly 80% protection against mosquitoes for 2 hours [18]. However, to get similar efficacy like eucalyptus oil, more than 20 times higher concentration of neem oil was required [27]. Neem infused water [28], papaya leaf juice [29-35], Gulancha (Tinospora cordifolia) and Tit Begun (Solanum xanthocarpum) shown to increase both blood platelets and WBC count, two of which are the worst side effects of dengue fever [36]. However, none of the above mentioned have been reported as safe in infant and pregnant women. Ripe papaya during pregnancy may not pose any significant danger. Drinking papaya juice with a few lemons drops in it may also work [37]. Folate and iron rich foods, Vitamins B-12, C, D and K improve platelet count [38].

References

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