



Utility of the secondary attack rate in reducing the caseload of infectious diseases

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ABSTRACT

Worldwide, to reduce the impact of any infectious disease, it is necessary to understand the transmission dynamics of infectious diseases, to ensure timely implementation of cost-effective and evidence-based public health measures. The secondary attack rate (SAR), estimates the probability of disease transmission to an individual who has been exposed to an infectious case. In conclusion, the epidemiological indicator - secondary attack rate – is a sensitive tool for the policy makers to reduce the incidence of new cases of an infectious disease, especially in household settings.

General Terms

Infectious diseases, Epidemiological tool.

Keyword: Secondary attack rate, index case, incubation period.

1. INTRODUCTION

Worldwide, to reduce the impact of any infectious disease, it is necessary to understand the transmission dynamics of infectious diseases, to ensure timely implementation of cost-effective and evidence-based public health measures.[1] Variable epidemiological indices (viz. case fatality rate, proportional mortality rate, etc.) has been used to estimate the burden of communicable diseases.[2] However, it is difficult to identify the precise reason for an increased risk for a specific disease (viz. high prevalence or enhanced risk of acquiring infection once exposed or increased risk of disease once infected), especially in endemic areas.[3] In addition, shortcomings in the current surveillance systems (viz. inability to estimate the potential risk to an individual after been exposed to an infectious case) further aggravates the problem.[3]



2. SECONDARY ATTACK RATE

To counter the above mentioned issues, an epidemiological indicator - secondary attack rate (SAR), which estimates the probability of disease transmission to an individual who has been exposed to an infectious case, is employed.[3,4] In general, SAR estimates the number of exposed persons who may develop the disease within the maximum incubation period, subsequent to the exposure to the primary case.[2] It is given by the formula:

Secondary Attack Rate = Number of exposed persons developing the disease within the duration of the maximum incubation period of the disease X 100 / Total number of exposed contacts

The denominator consists of all susceptible contacts that are exposed to the primary case.[2,4] SAR is an indicator to measure the infectivity of an agent with the help of studies performed in households.[2,3] In addition, the SAR not only provides an opportunity to the health professional to initiate appropriate preventive and infection control measures for households to prevent the spread of the disease among household contacts / community, but even facilitates early case detection and prompt initiation of treatment.[3,5] In addition, SAR empowers the program managers to evaluate the effectiveness of measures like immunization and isolation.[2] In the modern era, utility of secondary attack rate has gone beyond infectious disease, and now it even covers some of the chronic infectious & non-infectious diseases.[2,3,6,7] However, the universal applicability of secondary attack rate is limited only for those infectious diseases in which the primary case is infective for a brief duration.[2,4]

3. CONCLUSION

In conclusion, the epidemiological indicator - secondary attack rate – is a sensitive tool for the policy makers to reduce the incidence of new cases of an infectious disease, especially in household settings.

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