Actions For Immediate Response To Antimicrobial Resistant Gonorrhoea: A Case Analysis Exemplar Using The Modified Depestel Framework

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ABSTRACT

Antimicrobial resistance (AMR) is a growing global issue that causes significant morbidity. AMR causes more serious infections and consequences, increasing hospital stays and death. AMR threatens to undermine our capacity to cure common infectious infections. In this case, a clinician at a local sexual health clinic has recently alerted a 35-year-old male who has been seen in the clinic with probable AMR gonorrhoea. Consider the case's immediate consequences and select three measures to be addressed within the first several weeks. This article used the DEPESTEL (demographic structures, epidemiological patterns, political factors, economic influences, sociological trends, technological innovations, educational factors, and legislative requirements) framework to construct the response. In conclusion, AMR gonorrhoea infections stay in the body, increasing infection risk. Rapid gonorrhoea patient diagnosis is crucial for public health and clinical care of infected patients and sexual partners. Patients must be treated to cease transmission. AMR surveillance must include seasonal and epidemiological data. Keep track of treatment failures, warn partners, and prioritize clinical care. To appropriately analyze and handle treatment failure scenarios, cross-border collaboration is essential. Traveling overseas increases AMR gonorrhoea risk. Fear of AMR in the population may cause over-reaction to STIs. The media might assist in disseminating this vital health prevention, management, and security messages. People at risk need to be informed about the possibility of resistant gonorrhoea. Age, sex, sexual orientation, specimen location, prior infections, and concurrent STIs are also needed to be better reported.

Keywords: antimicrobial resistance, case analysis, DEPESTEL framework, health protection, outbreak control, strategic health protection response

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INTRODUCTION

Antimicrobial resistance is a global problem, affecting our capacity to treat infectious illnesses and undermining several other advancements in health and medicine. The draft global action plan's objective is to guarantee the successful treatment and prevention of infectious illnesses for as long as feasible using effective and safe medications that are quality-assured, responsibly used, and accessible to everyone who require them (Mendelson & Matsoso, 2015).

To accomplish this goal, the global action plan establishes five strategic objectives: (a) increase awareness and understanding of antimicrobial resistance; (b) strengthen knowledge through surveillance and research; (c) reduce the incidence of infection; (d) optimize antimicrobial agent use; and (e) develop an economic case for sustainable investment that takes into account the needs of all countries and increases investment in new medicines, diagnostic tools, and vaccines.

Background

Anti-microbial resistance (AMR) is an increasingly serious threat around the globe and is the cause of substantial morbidity (World Health Organization, 2020). AMR leads to more severe infections and complications, increasing the likelihood of longer hospital stays and of mortality. AMR threatens our ability to treat what were previously common infectious diseases.

Context

In this case, one of the public health practitioners working in London, United Kingdom in the regional health protection team, a clinician at a local sexual health clinic has just notified you that a 35-year-old man was seen in clinic today with a suspected case of anti-microbial resistant (AMR) gonorrhoea (Imperial College London, 2021). The patient in question identified as gay and has reported frequent unprotected sexual intercourse and a history of both gonorrhoea and syphilis infection. The man first presented to clinic with symptoms of a sexually-transmitted infection ten days after returning from a trip to Ibiza, Spain. He reported having engaged in unprotected sexual intercourse while abroad. Nucleic acid amplification testing confirmed gonorrhoea diagnosis.

The patient was initially treated with Ceftriaxone, however, when the infection did not clear after two weeks, azithromycin was prescribed. Unfortunately, the symptoms have persisted. The clinician suspects anti-microbial resistance and has notified the health protection team. On the latter part, the team confirmed that this in fact a case of AMR gonorrhoea. Anti-microbial resistance is a growing issue in the United Kingdom and globally.

Problem

Consider the short-term implications of this case, identify three actions that should be taken within the first few weeks following case identification. Recall the principles of outbreak control and prevention - applying the principles of health protection in managing an outbreak and identifying implications of a health protection threat and compose a briefing.

METHODS

In this article, the author have been tasked with managing the case and making appropriate recommendations for action in the short- and long-run. Using the knowledge of health protection, outbreak control, and strategic health protection responses: Consider the short-term implications of this case and identify three actions that should be taken within the first few weeks following case identification. Recall the principles of outbreak control and prevention. Consider how to sustain a response against AMR gonorrhoea in the longer-term (2-3 years) and how to reduce the risk of incidence in London. To help structure the response, this article consider the modified DEPESTEL framework (Lewis et al., 2014) as shown in Table 1.

Table 1. Modified DEPESTEL Framework

DEPESTEL Framework	Descriptions
Demographic structures	Age, sex, ethnicity, etc. of the population
Epidemiological patterns	Prevalence and incidence of diseases and risk factors within the population
Political factors	Current government policy, taxation, likely future changes to the political landscape
Economic influences	Competition, the availability of financial resources, unemployment, labour supply, etc.
Sociological trends	Attitudes and beliefs, lifestyle choices, press attitudes
Technological innovations	Research and development activity, new approaches, methods, or equipment
Educational factors	Implications and opportunities for education and educational settings
Legislative requirements	Relevant laws affecting the organisation, healthcare legislation,

employment laws, etc.

RESULTS AND DISCUSSION

Actions for Immediate Response to Antimicrobial Resistant Gonorrhoea Prevention and Information Enforcement

The case of anti-microbial resistant (AMR) gonorrhoea, threatens the effective prevention and treatment which may cause a great implication to the production of medicines, that is, to be ineffective and infections persist in the body, increasing the risk of spread to others. Therefore, as a public health practitioner, it is important to establish strategies to rapidly detect patients diagnosed with gonorrhoea who experience a clinical treatment failure following treatment with recommended certain medicines, including the clinical management of affected patients and their sexual partners.

Antimicrobial Surveillance Enforcement

Appropriate treatment must be administered to ensure successful patient management and to interrupt transmission. In order to sustain and maintain the procedures in response to Antimicrobial Resistant Gonorrhoea, it is vital to strengthen the surveillance to obtain AMR profiles in a seasonably manner and with sufficient epidemiological information to communicate a wide range of intervention.

Interventions

As an intervention, within the immediate response to AMR Gonorrhea, clinicians and other health practitioners should go hand-in-hand in preventing the spread of antimicrobial resistance through suitable clinical management and procedures, partner notification health services, and reporting cases of treatment failure. In this case, close collaboration and close coordination are crucial between health authorities to ensure that cases with probable or confirmed treatment failure are investigated and treated appropriately.

Longer-term Implications of AMR Gonorrhoea Using the DEPESTEL Framework

Demographic Structures

London is a major global city with substantial population movement both within

and outside of the area. International travel presents a risk to the spread and introduction of AMR gonorrhoea and may lead to difficulties in contact tracing if the patient of interest has engaged in unprotected sexual intercourse outside of the country and/or with someone not resident in London. London also has a large population of people who identify as LGBTQI+, in which gonorrhoea is more prevalent, and a large and mobile population of young people (15-35 years), who are more at risk of contracting a sexually transmitted infection.

Epidemiological Patterns

Gonorrhoea is a common STI with approximately 24,600 people are infected with gonorrhoea in London in 2018 (Public Health England, 2018). The diagnostic rate in 2018 was 279.4 per 100,000 in London and has been increasing since 2012 (Public Health England, 2018). There is also a large population at risk of contracting gonorrhoea, including young people under the age of 35 and men who have sex with men. These data suggest that the issue of gonorrhoea and AMR gonorrhoea is likely to increase.

Appropriate treatment must be administered to ensure successful patient management and to interrupt transmission, through the enforcement, strengthening and monitoring antimicrobial surveillance which is vital to further control emergence and spread of it. On the other hand, increasing epidemiological investigations of gonorrhea cases might help to give certain data to how to immediately response to it, as well as to sexual and social networks to help local jurisdictions better understand gonorrhea-related transmission dynamics in their area, population affected or under investigation of the said case. For epidemiological measures, updated guidelines are also needed for the management of gonorrhoea treatment failures. These guidelines should include alternative regimens in case of multidrug resistance.

Political Factors

In this case, collaboration and coordination is really important between partners in public health concern. Current government policy, taxation, likely future changes to the political

landscape, for example, the impositions of rules that might help to combat the problem like the SDGs, Sustainable Development Goals; that is, engaging politicians and policy makers in order to prioritize the issue and ensure that resources are available for culture and susceptibility testing. In this manner, there is a promotion on the establishment of health platforms across different disciplines involved in gonorrhoea control. In addition, in terms of the sustainable development goals, government policies and political landscape could create an action plan, with a specific guidelines and procedures in the said matter. Together with other health initiatives, they could perform an essential role in intensifying primary health care and elicits its utmost health service through partner engagements, to immunize, protect, and save people's health and lives, through a fair and progressive program, such as vaccine utilization.

Economic Influences

AMR is associated with increased costs for the healthcare system. Firstly, a range of treatments must be trialled on the index case, leading to additional drug costs, clinician time, and laboratory testing. AMR is associated with more severe infections and longer hospital stays, additional avoidable resource. Fear of AMR in the population may lead to people becoming overly worried about contracting a STI and 'worried well' individuals presenting at clinic for STI testing. This would present additional resource and capacity strain for sexual health clinics, and additional costs.

Sociological Trends

The involvement of the attitudes and beliefs, lifestyle choices, and press attitudes, are essential in combating the case. Participation in the external quality assessment program is part of the capacity building strategy in order to gain valid and comparable susceptibility data to reliably detect emerging resistance and optimize patient management. The media could be a helpful mode in delivering these essential ways on how to prevent, manage, and secure health, aside from health practitioners, there are a lot of health services that might contribute in the access of health information. Capacity building in certain region, if need such as

quarantines, will ensure that participating facilities and laboratories could produce unbiased and comparable data, in the development and improvement of the methods.

Technological Innovations

To easily manage the health concern, providing lab and its constituents on resistance to providers and public health personnel to quickly identify, treat, and stop the spread of resistant gonorrhea strains, could be one of the methods as well as the implementation of technological advancements to sustain its positive outcome. Moreover, there is a need of proper communication for the people at increased risk for acquiring this concern need to be aware of the threat of resistant gonorrhoea, this can be achieved by distributing the information through online communications and online health services dedicated and anchored in clinical settings. In this set-up, training should not be set aside, providing laboratory training and training modules help the adequacy and efficiency in eliminating and monitoring the risk factors.

Educational Factors

Delivering information, which directly teaches individuals and populations how to achieve better health, is also a helpful strategy in addressing this health concern. Implications and opportunities for education and educational settings such as the health initiative for health information and dissemination are important to address the public health concern. In addition, reporting of epidemiological variables, including age, sex, sexual orientation, specimen site, previous infections and concurrent STI diagnosed is important to understand the spread of infection; therefore, a need for improvement in the completeness of epidemiological characteristics, ensuring the epidemiological data for assessments and recommending improvements.

Public health information could pave the incoming cases of health trends, issues, and concerns. Clinicians and other healthcare professionals must be aware in order to guarantee effective patient treatment and to detect treatment failures early. This can be accomplished by communicating directly with

doctors and microbiologists (European Centre for Disease Prevention and Control, 2012).

Legislative Requirements

Patients accessing sexual health services in the UK have a right to be, and are considered anonymous. However, in order to effectively achieve contact tracing for AMR gonorrhoea, anonymity cannot be guaranteed. Furthermore, for other diseases where AMR is an established issue, screening is mandatory and directly observed treatment is required. These procedures override patient choice for the greater good and are employed in some situations for tuberculosis. It is possible that similar procedures may need to be considered for AMR gonorrhoea if there is a dramatic increase in incidence.

CONCLUSION

Antimicrobial resistance (AMR) gonorrhoea threatens efficient prevention and treatment, resulting in ineffective treatments and infections persisting in the body, increasing the risk of dissemination to others. As a public health practitioner, it is critical to developing techniques to swiftly identify gonorrhoea patients who fail to respond to prescribed therapy, including clinical care of afflicted patients and their sexual partners. Appropriate therapy is required to successfully manage patients and stop transmission. AMR surveillance must be strengthened to acquire AMR profiles seasonally and with adequate epidemiological information to transmit a wide range of treatments. The initial reaction to AMR Gonorrhea should be to avoid the spread of antibiotic resistance by appropriate clinical care, partner notification, and reporting of treatment failures. In this instance, significant collaboration and coordination across health authorities are required to properly assess and manage cases of potential or proven treatment failure.

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In accordance with the modified DEPESTEL framework, international travel presents a risk to the spread and introduction of AMR gonorrhoea. London also has a large population of people who identify as LGBTQI+. The diagnostic rate in 2018 was 279.4 per 100,000 in London and has been increasing since 2012. AMR is associated with increased costs for the healthcare system. Fear of AMR in the population may lead to people becoming overly worried about contracting a STI. The media could be a helpful mode in delivering these essential ways on how to prevent, manage, and secure health. There is a need of proper communication for the people at increased risk to be aware of the threat of resistant gonorrhoea. There is also a need for better reporting of epidemiological variables, including age, sex, sexual orientation, specimen site, previous infections and concurrent STIs.

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