Antibiotic Bacterial Resistance

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What is antibiotic resistance?

Antibiotic/Antimicrobial resistance (AMR) is a terminology used to describe immunity to an antibiotic. When a bacteria becomes antibiotic resistant, it means the antibiotic attributed to killing it, no longer has an effect. This immunity can be gained by a bacteria coming into direct contact with an antibiotic, with the frequency of contact often determining the rate of resistance. Also by a bacteria joining to an antibiotic resistant strain, genetic material can be transferred, including immunity, to give them both resistance (Burmeister, 2015).

Worrying statistics

- Every year 1,985,603 U.S. citizens become infected with a strain of antibiotic resistant bacteria. 33,205 of those infected result in death (Centers for Disease Control and Prevention, 2016).
- In 1999, 36% of UK patients suffering from either a cough or cold, were prescribed an antibiotic. In 2011, that number rose to 51% (Hawker et al., 2014).
- The UK Government in 2014 released a study commissioned by the Prime Minister, which forecasted by 2050, 10 million deaths could be attributable to antibiotic resistant bacteria, with cancer at 8.2 million (O'Neil, 2014).

What can be done to help slow it down?

- By applying an anti-septic to an open wound, an infection can be prevented (Langley, 2002).
- From good hygiene, bad bacteria which we may unknowingly come into contact with can be killed (Langley, 2002).
- By increasing the number of vaccinations, immunity from a bacteria such as Tuberculosis can be acquired. In 2012, WHO recorded TB have caused 170,000 deaths globally (Ventola, 2015).
- By reducing the amount of misused antibiotics, the rate of evolution for a bacterium can be slowed (Lee et al., 2013).

Figure 1. Cows. They are one of the many livestock species which are fed antibiotics therapeutically. This method once accounted for approximately 48% of all antibiotic production (Stallones et al., 1980). It is no longer practised in Europe (Marshall and Levy, 2011). This image can be found in the public domain and falls under the creative commons CC0.

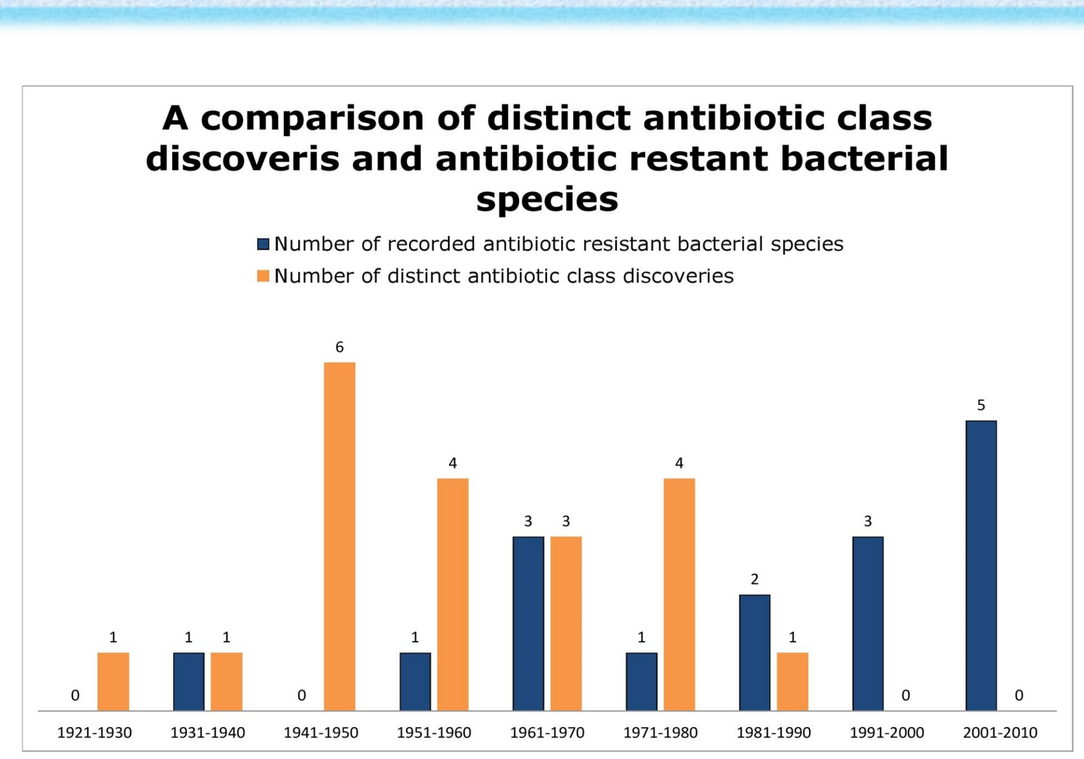

Figure 2. This column chart represents the number of antibiotic class discoveries over a period of time (Silver, 2011), from 1921-2010, parallel to the discoveries of anti resistant bacterium (Ventola, 2015). A trend shows that a decrease in the number of antibiotic discoveries, correlates with an increase in the amount of drug resistant bacteria.

Summary

By employing greater use of antiseptics, reducing the amount of antibiotic misuse and completing the cycle(s) prescribed, reducing the amount of antibiotics therapeutically fed to livestock, promoting good hygiene, a greater amount of clinical research into the discovery of new antibiotics, and an increased amount of vaccinations, the rate and threat of bacteria resistance can be reduced, and potentially eliminated.

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