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Influence of the COVID-19 pandemic on the epidemiology and resistance of *Neisseria gonorrhoeae* in Austria

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Background: The COVID-19 pandemic that hit Austria in 2020 led to several lockdown events concomitant with the closing of bars, clubs, hotels and the instruction of avoiding contacts. The current study was designed to elucidate the influence of these restrictions in order to curtail the pandemic on the number of *N. gonorrhoeae* diagnosed and resistance patterns.

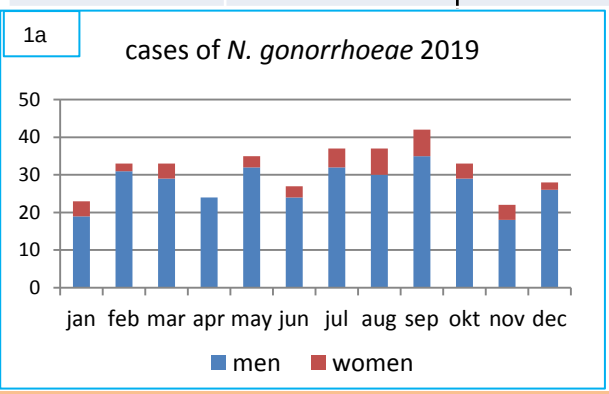
Material and Methods: The number of patients positive for *N. gonorrhoeae* by culture and resistance patterns of gonococcal strains to ceftriaxone, cefixime, azithromycin and penicillin were compared using data collected in 2019 and 2020. Resistance testing performed using the Etest®; MIC values were interpreted according to EUCAST guidelines.

Results: Total number of culture positive *N. gonorrhoeae* decreased from 2019 to 2020 by 16.9% (Tab. 1).

Tab. 1: number of *N. gonorrhoeae* 2019 and 2020

Number of diagnosed *N. gonorrhoeae*	2019 men	2019 Women	2020 men	2020 women
	329	45	267	44
Total	**374**		**311**	

Fig. 1 shows postive *N. gonorrhoeae* cultures according to the month of collection. In 2020 the first lockdown (15.3. – 31.5.) led to a 55.2% decrease of diagnosed *N. gonorrhoeae* cases, whereas this effect was not observed in the following lockdown events (November: plus 50% and December: equal number).



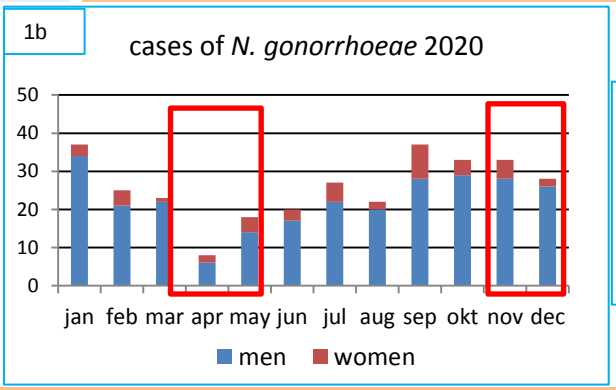
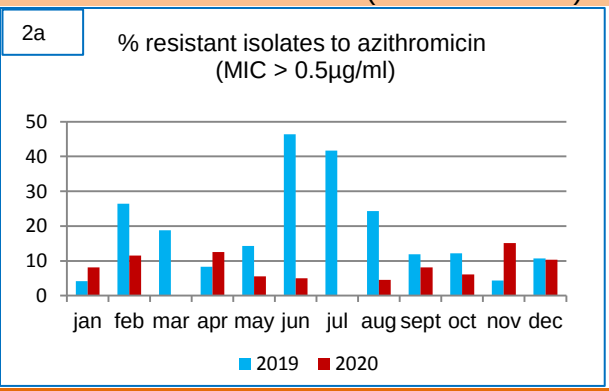


Fig. 1a and 1b: Numbers of *N. gonorrhoeae* per month in 2019 and 2020 diagnosed by culture.

Antimicrobial resistance testing revealed that resistant isolates to azithromicin (Fig. 2a) and resistant and borderline resistant isolates to cefixime (Fig. 2b) decreased in 2020; penicillin resistant strains increased from 9% in 2019 to 20% in 2020 (data not shown). In both years no ceftriaxone resistant isolate was detected.



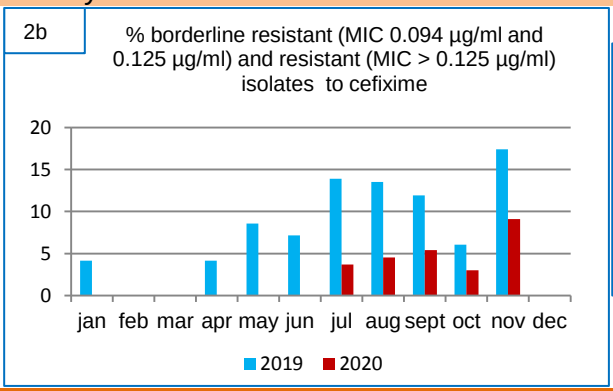


Fig. 2a and 2b. Resistant (azithromicin), as well as resistant and borderline resistant (cefixime) isolates of *N. gonorrhoeae* in 2019 and 2020.

Conclusion/ discussion: The first lockdown resulted in a significant decrease of *N. gonorrhoeae* infected individuals; however, this effect was not continued not even during the other lockdown events. Although resistant strains to azithromycin and cefixime have decreased during the pandemic, culture and antimicrobial resistance testing remain indispensable to guide gonococcal treatment decisions, as towards the end of the year 2020 resistances were increasing again.