Okayama University Medical Research Updates （OU-MRU） 2023.02 Vol.111

Source: Okayama University (JAPAN), Public Relations Division

For immediate release: 03 March 2023

Okayama University research: Antibiotics use in cataract surgery

(Okayama, 03 March) **In a study recently published in the *International Journal of Environmental Research and Public Health*, researchers from Okayama University make a question on the use of intravenous and oral antibiotics as a precautionary measure to prevent eye infections after cataract surgery.**

Over the last decade antimicrobial resistance has emerged as an important global health concern. This is the resistance that microbes, mainly bacteria, develop to standard antibiotics due to the widespread and often redundant use of such drugs. The bacteria then stop responding to antibiotics used against them, potentially increasing the possibility of infection. An example of such routine use of antibiotics in Japan is during cataract procedures to prevent the risk of contracting eye infections during surgery. However, the effectiveness of these medications in this context is still uncertain. Now, a team led by Professor MATSUO Toshihiko (M.D.) at Okayama University has analyzed the outcomes of antibiotics routinely used with cataract procedures over the last six years.

The researchers gathered information on 2149 cataract surgeries performed and antibiotics given for surgical procedures performed by a surgeon at Ochiai Hospital in the Okayama prefecture from April 2016 to October 2022. Next, based on the patterns of intravenous and oral antibiotics administered around the procedure, five different stages were categorized over time. The dose of antibiotics decreased with each stage.

Stage 1 involved a dose of intravenous and oral antibiotics on surgery day followed by doses of the oral antibiotic for 2 days post surgery. Stage 2 involved doses of the oral antibiotic on and 2 days post surgery. Stage 3 involved a switch to a different oral antibiotic on and 2 days post surgery, whereas Stage 4 involved just one dose of it on the day of surgery. Finally, Stage 5 which was implemented in November 2021, involved no antibiotics on the day of or after surgery.

The incidence of postoperative eye infections and strains of bacteria found on the eye surface before surgeries were then examined in each stage. The researchers found no difference in species of bacteria found on the eye surface of patients between all five stages. Furthermore, no cases of eye infection post cataract surgery were found in any of the five stages. Thus, the eliminated use of intravenous and oral antibiotics with cataract surgery in Stage 5 showed no increased risk of eye infection.

The research team concludes that there is no evidence of either harm or risk in reduced and later no use of systemically given prophylactic antibiotics in cataract surgery as far as local precautionary measures are taken. As the common standard of the local precautionary

measures in each stage, prophylactic antibiotic eye drops are given before and after the surgery, and the ocular surface during the surgery is frequently washed with disinfectants such as povidone iodine. Cataract surgery might be one potential channel to reduce the intravenous and oral administration of antibiotics as a redundant precautionary measure. Spreading this message across different institutions in Japan that follow this protocol for cataract surgeries might also help reduce the unwanted use of antibiotics.

Background

Antibiotics and antimicrobial resistance: The World Health Organization published an action plan to mitigate antibiotic use across the globe in 2015. Antibiotics, traditionally used to fight bacterial infections, have often been used redundantly or without prescription across the globe. This has resulted in bacteria developing resistance to these standard antibiotics. These resistant bacteria are, in turn, much harder to fight. What's more, bacteria are developing faster ways to bypass the effects of antibiotics making them even more difficult to combat.

Besides practicing good hygiene measures, the best way to fight this issue is to minimize the use of antibiotics unless necessary as deemed by a medical professional. Japan is one of the few countries to adopt antibiotic use as a routine supplement along with cataract surgery. Thus, the researchers aimed to investigate whether this use of antibiotics is effective or not.

Stage	Period	Intravenous Antibiotics on Surgery Day	Oral Antibiotics on Surgery Day	Oral Antibiotics on the Next 2 Days	Number of Surgery	Right Eye/Left Eye	Men/ Women	Range of Age (Median)
Stage 1	April 2016–18 January 2018	Cefazolin 1 g	Cefdinir 100 mg	Cefdinir 300 mg	649	333/316	194/229	41–93 (77)
Stage 2	26 January 2018–August 2019	None	Cefdinir 200 mg	Cefdinir 300 mg	541	273/268	158/187	50–101 (77)
Stage 3	September 2019–December 2019	None	Levofloxacin 500 mg	Levofloxacin 500 mg	103	54/49	25/47	56–92 (76)
Stage 4	January 2020–October 2021	None	Levofloxacin 500 mg	None	545	270/275	144/202	45–94 (77)
Stage 5	November 2021–October 2022	None	None	None	311	160/151	84/111	47–101 (75)

Table

The number of cataract surgeries in each stage.

Reference

Toshihiko Matsuo, Masahiro Iguchi, Noriyasu Morisato, Tatsuya Murasako, Hideharu Hagiya. Are Prophylactic Systemic Antibiotics Required in Patients with Cataract Surgery at Local Anesthesia? *Int J Environ Res Public Health*, 2022 Nov 27;19(23):15796.
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Reference (Okayama Univ. e-Bulletin): Dr. MATSUO's team

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Okayama University is one of the largest comprehensive universities in Japan with roots going back to the Medical Training Place sponsored by the Lord of Okayama and established in 1870. Now with 1,300 faculty and 13,000 students, the University offers courses in specialties ranging from medicine and pharmacy to humanities and physical sciences.

Okayama University is located in the heart of Japan approximately 3 hours west of Tokyo by Shinkansen.

Website: http://www.okayama-u.ac.jp/index_e.html

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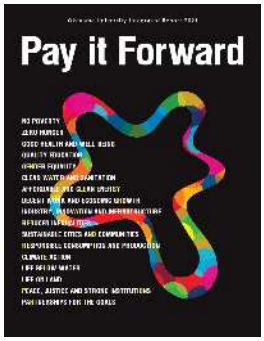

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