Study Links Common Dental Issue to Breast Cancer Risk

Description

Recent research has uncovered an unexpected connection between oral health and breast cancer. Scientists found that a common bacterium linked to gum disease can enter the bloodstream and settle in breast tissue, leading to DNA damage and promoting the growth and spread of tumours.

The study, conducted by the Johns Hopkins Kimmel Cancer Center and the Bloomberg-Kimmel Institute for Cancer Immunotherapy, indicates that this bacterium not only affects the tissue but also makes cancer cells more aggressive and less responsive to treatment. Dr Dipali Sharma noted that the research was motivated by previous smaller studies that showed a link between periodontal disease and breast cancer.

Dr Sheetal Parida, the first author of the study, stated the team aimed to explore these connections further. They used mouse models and human breast cancer cells to investigate how the bacterium impacted breast tissue. The research revealed that when the bacterium was introduced into breast ducts, it caused inflammation and DNA damage, whereas when it entered the bloodstream, it significantly accelerated the growth of existing tumours.

The study also identified a crucial biological process: exposure to the bacterium damaged cellular DNA, activating repair mechanisms that could introduce errors. Additionally, it raised levels of a protein called PKcs, associated with cancer cell movement and resistance to chemotherapy.

While the findings highlight a potential link between oral microbes and the risk of breast cancer, further research is needed to understand its implications for patient care. Dr Sharma emphasized that these results suggest that various risk factors, including genetic ones like BRCA1 mutations, may interact with this bacterium, increasing breast cancer risk and tumour aggressiveness.

Vocabulary List:

1. **bacterium** //bæk'tɪriəm// (noun): a very small living thing that can cause disease
2. **bloodstream** //'blʌdstri:m// (noun): the flow of blood inside the body
3. **DNA** //ˌdi:ɛn'eɪ// (noun): material in cells that has genetic instructions
4. **inflammation** //ˌɪnflə'meɪʃən// (noun): swelling and pain as the body reacts
5. **resistance** //rɪ'zɪstəns// (noun): when a drug or treatment stops working well
6. **mutations** //mju:'teɪʃənz// (noun): small changes in genes that can affect cells

Comprehension Questions

Multiple Choice

1. What common bacterium is linked to gum disease and breast cancer?

   Option: E. coli
   Option: Streptococcus mutans
   Option: Porphyromonas gingivalis
   Option: Lactobacillus

2. Which research institution conducted the study on oral health and breast cancer?

   Option: Harvard University
   Option: Stanford University
   Option: Johns Hopkins Kimmel Cancer Center
   Option: Yale University

3. Who is the first author of the study?

   Option: Dr Dipali Sharma
   Option: Dr Sheetal Parida
   Option: Dr John Doe
   Option: Dr Jane Smith

4. What accelerates the growth of existing tumors according to the study?

   Option: High sugar diet
   Option: Bacterium entering the bloodstream
   Option: Regular exercise
   Option: Antibiotics

5. What risky protein levels were raised by the bacterium?

   Option: PKcs
   Option: EGFR
   Option: HER2
   Option: TP53

6. What does the bacterium cause when introduced into breast ducts?

   Option: Cell death
   Option: Inflammation and DNA damage
   Option: Tumor regression
   Option: Enhanced immunity

True-False

7. The study indicates that the bacterium makes cancer cells more responsive to treatment.

8. The research suggests a link between oral microbes and breast cancer risk.

9. Dr Dipali Sharma is the first author of the study.

10. The research was motivated by previous studies showing a link between periodontal disease and breast cancer.

11. The study used human breast cancer cells and dog models for investigation.

12. Further research is needed to understand the implications of the findings for patient care.

Gap-Fill

13. The common bacterium linked to gum disease can enter the bloodstream and settle in breast tissue, leading to DNA damage and promoting the growth and spread of _____.

14. Dr Sheetal Parida stated that the team aimed to explore these connections _____.

15. The study revealed that the bacterium caused inflammation and DNA damage when introduced into breast _____.

16. The exposure to the bacterium damaged cellular DNA, activating repair mechanisms that could introduce _____.

17. The findings suggest that various risk factors may interact with this bacterium, increasing breast cancer risk and tumour _____.

18. The study conducted by the Johns Hopkins Kimmel Cancer Center indicates that the bacterium makes cancer cells more aggressive and less _____ to treatment.

Answer

Multiple Choice: 1. Porphyromonas gingivalis 2. Johns Hopkins Kimmel Cancer Center 3. Dr Sheetal Parida 4. Bacterium entering the bloodstream 5. PKcs 6. Inflammation and DNA damage
True-False: 7. False 8. True 9. False 10. True 11. False 12. True
Gap-Fill: 13. tumours 14. further 15. ducts 16. errors 17. aggressiveness 18. responsive

CATEGORY

1. Health - LEVEL5

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