Exposing women oyster seekers to estuary water over the pap smear in Krueng Tibang river, Alue Naga, Banda Aceh

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Abstract. In Aceh, oyster hunting is mostly carried out by women, by sitting or squatting inside the estuary water. The job is carried out every day for many years, with an average duration of two until three hours/day. During this activity, the female genital organ is an open cavity which is an entry point of substances into the body. The residential drainage channels in Banda Aceh City, consists of Alue Naga and Krueng Tibang Rivers Furthermore, the water quality of the Krueng Cut river is in class III, and it contains coliform bacteria, fecal coliform, and streptococcus fecal bacteria. However, the oysters extracted contain lead, cadmium, and zinc, which are above the safety level. The purpose of this study was to determine the effect of age, and duration of work using vaginal douches on pap smear result test in woman oyster seekers. The research subjects comprised of 60 respondents, which was obtained by purposive random sampling. The result showed that 75% of the respondents in abnormal category (PAP II), had pap smear results. A total of 39 respondents (65%) were in the reproductive age, with 35 (58.3%) of them having worked for more than five years, while 25 (41.7%) did not utilize the vaginal douching after work. Furthermore, it influences the age of Pap smear results (p-value=0.00), the length of work affecting the pap smear result test (p-value=0.00), and the vaginal douching that influences the pap smear results (p-value=0.001). Logistic regression analysis showed that the most influential variable on Pap smear results was the length of work (p-value =0.005) and vaginal douching utilized (p-value =0.002), with its results not affecting by age.

1. Introduction
Estuary water in Aceh is utilized daily by half the population of women to hunt for an oyster. This is carried out by entering the water, which is mixed with mud, with its level slightly above the adult
waistline. Once the water starts receding, the worker sits or squats according to its height for the easy working process. The Exposure of workers to this river usually occurs within two or three hours/day without using personal protective equipment. Due to this, the estuary water tends to come in contact with the genitalia organ through the vagina.

Therefore, the Krueng Tibang River, located in Syiah Kuala district of Banda Aceh is an artificial waterway. It is also used as a drainage system and to cultivate fishes with its water quality in the Class III category and utilized [1]. Oyster acquired from Krueng Lamnyong contain heavy metals that is hazardous because of its ability to make metal-protein interaction, i.e. lead [2], cadmium [3], and zinc above the human safe consumption limit, thereby, making it inconsumable [4].

The women's genitalia organ is one of the entrance (port de entry) of a foreign object into the body. The genitalia organ consists of two main parts, namely internal and external genitalia organs [5]. However, the orificium vagina, which is an open cavity, is a possible entrance channel of microorganism into the genitalia organ and spreads all over the body. The vagina is also an alternative exposure pathway in women, with the potential to negatively impact on their health. Furthermore, women who utilize pads containing mercury have an increased tendency level and biomarkers of oxidative stress in the blood [6].

Pap smear is one of the effective methods of early detection of cervical cytology and irritability [7]. Its results are classified into five categories. PAP I contains no abnormality or atypical cells, the PAP-II found atypical cytology, with no malignancy, PAP III was suspected of containing malignant cytology, along with mild to moderate dysplasia. In PAP IV cytology was found malignancy with severe dysplasia, while PAP V showed malignancy in cytology [8].

2. Materials and Methods

This study aimed at determining the effect of estuarine water exposure on pap smear results test of women working as oyster seekers in Krueng tibang and Alue Naga Rivers. This is observational analytic research, comprising of cross-sectional designs. Data collection was carried out for seven months, namely in March to April 2017. The population in this study were all women worker of oyster seekers in the Krueng Tibang river and Alue Naga river in Banda Aceh city with 78 people. The samples were 60 women were obtained through purposive random sampling with the following criteria: willing to be a respondent, regularly working, getting married and not suffering from reproductive system disorders.

Data collection is conducted through direct observation of the location where the respondent works, interviews, and examination of cervical mucus (Pap smear test). Pap smear examination was carried out at the Prodia Banda Aceh clinical laboratory. The required that must be fulfilled by respondents at the time of the examination are: not having hout sexual relations in the last 48 hours, after the 14-15 day period and those that have not utilize vaginal cleansing soap in the last 2 days. Ethical clearance was obtained from the Health Research Ethics Commission of the Faculty of Nursing, University of North Sumatra. The results of the research data were analysed using the chi-square and Binary logistic regression tests.

3. Result and Discussion

Most respondents (65%) in the reproductive age group were below 49 years. However, 58.3% of the respondents worked as oyster seekers for more than 5 years, during which 41.7% failed to utilize the vaginal douche after work. Pap smear results for most oyster women (75%) were in the abnormal category (Table 1).

There are no normal Pap smear results in perimenopause age group respondents. However, 100% of women in the reproductive group had normal pap smear, with an influence between both results (p-value = 0.00). Furthermore, the duration of work affects 73.3% of the respondents leading to Pap smear (Table 2). In addition, those who worked for less than five years (86.7%) were in the normal category. The used of vaginal douche affects pap smear results (p-value = 0.001) with 53.3% non-users and 93.3% users.
Regression analysis modelling on the three statistically significant variables showed that the age variable was not insignificant with Pap smear results ($p = 0.098$), with the most influential variable being the length of work ($p = 0.005$) and vaginal douching ($p = 0.002$) (Table 3).

**Table 1.** Frequency distribution of respondents based on age, length of work, use of vaginal douches and Pap smear results test

| Variable                        | Frequency |   |
|---------------------------------|-----------|---|
| **Age**                         |           |   |
| Perimenopause (> 49 years)      | 21        | 35 |
| Reproductive (≤ 49 years)       | 39        | 65 |
| **Length of work**              |           |   |
| ≤ 5 years                       | 25        | 41.7 |
| > 5 years                       | 35        | 58.3 |
| **Vaginal douches**             |           |   |
| Ever/Rarely                     | 35        | 58.3 |
| Never                           | 25        | 41.7 |
| **Papsmear results test**       |           |   |
| Normal                          | 15        | 25.0 |
| Abnormal                        | 45        | 75.0 |

**Table 2.** Effect of age, length of work and use of vaginal douches on pap smear results test

| Variable                      | Pap smear results test |   |   | P  |
|-------------------------------|------------------------|---|---|----|
|                               | Abnormal | Normal | N | % | N | % |
| **Age**                       |           |         |   |   |   |   |
| Perimenopause (> 49 years)    | 21        | 0       | 45.7 | 0.0 | 0.00 |
| Reproductive (≤ 49 years)     | 24        | 15      | 54.3 | 100 |    |
| **Length of work**            |           |         |   |   |   |   |
| > 5 years                     | 33        | 2       | 73.3 | 13.3 | 0.00 |
| ≤ 5 years                     | 12        | 13      | 26.7 | 86.7 |    |
| **Vaginal douches**           |           |         |   |   |   |   |
| Never                         | 24        | 1       | 53.3 | 6.7  | 0.001 |
| Ever/Rarely                   | 21        | 14      | 46.7 | 93.3 |    |

**Table 3.** Logistic regression analysis influences all variable

| Variable         | B  | Wald | P  |
|------------------|----|------|----|
| Age              | -19.196 | 0.000 | 0.998 |
| Length of work   | -3.081 | 7.992 | 0.005 |
| Vaginal douching | -4.039 | 9.892 | 0.002 |
Most of the pap smear results of female oyster seekers in the perimenopause age group were in the abnormal category. Furthermore, exposure to estuary water through the genital organs in women continuously has a negative influence on reproductive health. Age factor will aggravate pap smear results to be abnormal, which degenerates the perimenopause cells and stimulate the growth of inflammatory cells. The results of Pap smear cytology examination in women group between 40-50 years are generally in the abnormal category [9]. Krueng tibang and Alue Naga esturian water river contained coliform bacteria, fecal coliform, and streptococcus fecal bacteria and heavy metals [10]. Continuously exposure to microorganisms and heavy metals in the body causes macrophages and free radicals to appear. [11]. Free radicals will trigger oxidative stress. Oxidative stress is caused by a condition of homeostasis, a prooxid imbalance with antioxidants. These reactions form toxic reactive oxygen species (ROS). The results of this formation are hydrogen peroxide radicals, organic hydro peroxide, oxidants, superoxide and hydroxyl. This reaction is the biggest cause of disease and aging in humans. Oxidative stress works by deactivating metabolic enzymes, damaging cellular components and oxidizing nucleic acids. finally it can cause interference with the body's systems, including degenerative diseases and disorders of the reproductive system [12].

Working to look for oysters for more than five years have an effect on abnormal pap smear results. Long work shows the length of time women are exposed to estuarine water, especially genital organs. Various pathogenic microorganisms, toxicants and hazardous substances contained in estuary water can expose the body. Toxicant and hazardous substances that are absorbed by the body and have an adverse effect on reproductive health and reproductive outcomes [13]. Hazardous chemicals can enter the vagina through sexual intercourse, medical intervention, swimming, soaking and vulva hygiene activities, or from the workplace environment [14] Common body exposure pathways through the skin, (including mucosa and hair), inhaled through the nose and swallowed through the oral cavity [15].

Cervicovaginal Secretions is a natural antimicrobial, taken by antimicrobial polypeptides, lactic acid, and an appropriate vaginal pH (3.8-4.5) [16]. Hazardous substances, pathogenic microorganisms, and continuous chemicals in the vagina cause cervicovaginal secretions abnormality. However, the use of vaginal Douching has been recommended as a good practice for women's reproductive health, owing to its ability to reduce the susceptibility to Chlamydia, infectious pathogens, Gonococcus, and human papillomavirus. Furthermore, vaginal rinse also reduces the risk of pelvic inflammatory diseases [14].

4. Conclusion
Continuous exposure to estuary water in oyster seekers can worsen the results of Pap smear tests. Estuary water exposure in perimenopoose age group women was the trigger for the outcome of the Pap smear test. ignoring vaginal douching after exposure to estuarine water can result in pathology pap smear test.

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