American Journal of Biomedical Sciences
ISSN: 1937-9080
nwpii.com/ajbms

Studies on Histopathological Cell Changes in Breast Cancer Using Breast Diseases Tissue Blocks in Enugu State University Teaching Hospital 2009 -2013

UMEH, Gabriel Uzoma[1,2], ACHUKWU, P.U[2], OMORODION, Nosa Terry[1,2*]

[1]Department of Medical Laboratory Science, Colleges of Basic Medical Sciences University of Benin, Benin City, Nigeria
[2]Department of Medical Laboratory Science, Faculty of Health Sciences and Technology, University of Nigeria, Enugu Campus, (UNEC) Nigeria
[*]**Corresponding Author**
OMORODION, Nosa Terry
Department of Medical Laboratory Science
Colleges of Basic Medical Sciences
University of Benin
Benin City
Nigeria
Cell no. 08136742270
Email: terry.omorodion@uniben.edu

Received: 09 February 2017; | Revised: 11 July 2017; | Accepted: 21 July 2017

Abstract

Cancer is an uncontrolled growth of breast cell, it occurs as a result of mutations or abnormal changes, in the genes responsible for regulating the growth of cells and keeping them healthy. The genes are in each cell. Normally, the cell in our bodies replace themselves through an orderly process of cell growth: healthy new cells take over as old ones die out. A tumor can be benign (not dangerous to health) or malignant (has the potential to be dangerous). Benign tumors are not considered cancerous: their cells are close to normal in appearance, they grow slowly, and they do not invade nearby tissues or spread to other parts of the body. Malignant tumors are cancerous. Left unchecked, malignant cells eventually can spread beyond the original tumor to other parts of the body. Breast cancer can be defined as a malignant tumor of breast usually associated with painless lump in the breast usually associated with painless lump in the breast. Available evidence suggests that breast cancer in most parts of Africa is the leading cause of mortality associated with cancers in African women. Recent global cancer statistics indicates rising global incidence of breast cancer with faster increase occurring in developing countries. To determine the histopathologic cell changes in breast cancer using breast disease tissue blocks in Enugu State University Teaching Hospital 2009-2013. Most women with breast cancer seek medical help at the terminal stage of the disease. This may be a contributory factor to increased number of patient having invasive ductal carcinoma (IDC) as seen in the study. The results of this study suggest that breast cancer is increasing in Nigeria and needs an urgent intervention measure. Cancer cells are treatable if only detected early enough, our findings reveals that breast

cancer is on the rise amongst women between the ages of 40-49. Conclusively, I think preventive medicine is still preferable to curative in regard to cancer.

Keywords: Histological cell changes, Breast Cancer, Malignant cell tumor

1. Introduction

Breast cancer is an uncontrolled growth of breast cell, it occurs as a result of mutations or abnormal changes, in the genes responsible for regulating the growth of cells and keeping them healthy. The genes are in each cell. Normally, the cell in our bodies replace themselves through an orderly process of cell growth: healthy new cells take over as old ones die out. But over time, mutations can "turn on" certain genes and "turn off" others in a cell. That changed cell gains the ability to keep dividing without control or orders, producing more cells just like it and forming a tumor [1]. A tumor can be benign (not dangerous to health) or malignant (has the potential to be dangerous). Benign tumors are not considered cancerous: their cells are close to normal in appearance, they grow slowly, and they do not invade nearby tissues or spread to other parts of the body. Malignant tumors are cancerous. Left unchecked, malignant cells eventually can spread beyond the original tumor to other parts of the body [2]. The term "breast cancer" refers to a malignant tumor that has developed from cells in the breast. Usually breast cancer either begins in the cells of the lobules, which are milk producing glands or the ducts, the passage that drains milk from the lobules to the nipples. Less commonly, breast cancer can begin in the stromal tissues, which include the fatty and fibrous connective tissues of the breast [3]. Cancer (ca) is a disease entity characterized by uncontrolled cell proliferation. Unless checked, the cancer cell invades the circulation and spread throughout the function of normal cells and leads to death of the patient. Breast cancer can be defined as a malignant tumor of breast usually associated with painless lump in the breast usually associated with painless lump in the breast [4]. Available evidence suggests that breast cancer in most parts of Africa is the leading cause of mortality associated with cancers in African women [5]. Recent global cancer statistics indicates rising global incidence of breast cancer with faster increase occurring in developing countries. One in every eight women in US is expected to develop breast cancer in her life time [6]. Breast cancer is the second most common cancer after skin cancer and the second leading cause of death after lung cancer in the US annual mortality rate of 44,000 [7].In Europe 43,000 new cases of breast cancer occur each year. Although breast cancer poses problems in all the countries, it exerts its heaviest toll on human lives in Africa. The higher rate may be attributed to factor such as lack of awareness of breast cancers and its consequences in African population, late stage of presentation and effective treatment of breast cancers in African countries. The number of breast cancer in Nigeria has been increasing within the recent years and the increase affect all ages but highest in women aged 40-49 years [7]. Carcinoma of breast is still a major cause of morbidity and mortality among Nigeria women. Research studies are needed to determine prevalence, epidemiology as well as risk factor for cancer in Nigeria with emphasis on women of child bearing age. Early prevention of the disease in order to reduce associated mortality in African women [8]. Many cases of breast cancers in Africa present in late stage, when very little can be done to salvage the situation. Recent research shows that 13.9% breast cancers were in a total of 1,216 cases of cancer registered between 2001 and 2005 Maiduguri, North East Nigeria [9]. Asia American have the lowest prevalence of breast cancer (0.5%) of carcinoma-associated gene mutation BRAI[10] . whereas African American have the highest prevalence BRAI mutation, in patient diagnosed before age of 35 years (16.7%)[10]. In African and Asia, the breast cancer incidence raised 3.5% to 13.5% in a hospital based studies [11]. The cause of breast cancer is unknown but may implicate estrogen. Viral aetiology was recorded [12]. Other risk factors of developing rate menopause, hormonal replacement therapy, oral contraceptives,

use of diestylstillbesterol to prevent miscarriage, nulliparousity, radiations, certain benign breast condition, obesity. Parity before 20years, multiple pregnancies, breast feeding for one year six months to 2 years, lowers the risk of breast cancer occurrence. Most of breast cancer death occurs in women of age 50 and older. However, it may develop anytime after puberty. Breast cancer rarely occurs in male (about 1% of all cases of breast carcinoma) [13]. To determine the histopathologic cell changes in breast cancer using breast disease tissue blocks in Enugu State University Teaching Hospital 2009-2013. The commonest histological type of breast cancer was invasive ductal carcinoma which accounted for 82.6%; invasive lobular 6.6% medullary 4.3%; colloid 1.7%; papillary 1.1%; and other 5.1% [11]. Metastatic carcinoma of the breast spread virtually to every organ in the body. Distant spread is usually by lymphatic or haematogenous routes[14]. Patient with breast cancer had significantly increased fibrinogen levels. Developing breast cancer is no one's fault. Feeling guilty, or telling yourself that breast cancer happened because of something you or anyone else did, is not productive.

2. Materials and Methods

The study was a retrospective study of breast tissue biopsy/ blocks of women at reproductive age with provisional diagnosis of breast disease, submitted to Histopathology Laboratory Department of ESUT University Teaching Hospital from a period of January 2009 to December 20013. The diagnosis was obtained from the department register through which the tissue blocks were traced for processing and diagnosis. This study was institution based study hence was carried out in Histopathology Laboratory Department of ESUT University Teaching Hospital, Enugu State Eastern Nigeria. ESUTH as a central health institution receives samples from all part of Anambra state, Imo state, Delta as well as some part of Benue state. The study population involves all women at age between 16 and 50 years that attended ESUTH who had submitted their breast biopsy to the Histopathology department. Sample sizes of 100 tissues were randomly selected from these populations.

Information about patient whose breast tissue were selected, 100 breast tissue blocks randomly selected from among the age stated and within the study year, haematoxylin and eosin (H and E) staining solution. Different grades of alcohol, slides, water bath, oven, 20% alcohol, microtome, wooden block holder, xylene, DPX, scapula blade, Scott tap water, staining rack. Samples were randomly selected in order to minimize error due to bias. The method chosen gave every breast biopsy under the period of study fair chance of being selectected Tissue was placed on a block holder trim and sectioned. For the serial sections, rotary microtome was used. The tissue advances against the knife edge at a predetermined size (0.3-0.5micro) as the microtomist rotates the handle [15].H and E staining technique was employed in accordance with [14]. H and E contains basic and acidic competent. In staining the basic dye (heamatoxylin) stains the nuclei blue while the acidic dye (eosin) stain the cytoplasm and other components with different shades of pink/red. The slides were viewed by Histopathologist for diagnosis to determine the proportion of breast cancer among other breast disease. Photomicrographs were also taken to show the diagnostic features of various breast diseases. In analyzing the data, the following statistical principles were employed: Tallying for counting response to each disease type and to each age group, frequency distribution table, percentages, pie chart, ANOVA and f-ratio were employed for test of significance at $P < 0.05$. Breast cancer is quite common and its complication is quite devastating. The fact that only few study has been carried out in this environment makes the study imperative.

3. Results

The result of this thesis clearly show that breast cancer on the increase, women between the ages of 40-49 has more chances of developing breast cancer as shown on the chat below.

Table 1: 5 Years distribution of breast disease

Year	Paget's disease	Breast cancer	Others
2009	10	50	20
2010	10	80	20
2011	10	80	10
2012	0	90	20
2013	10	120	0
Total	40	420	70

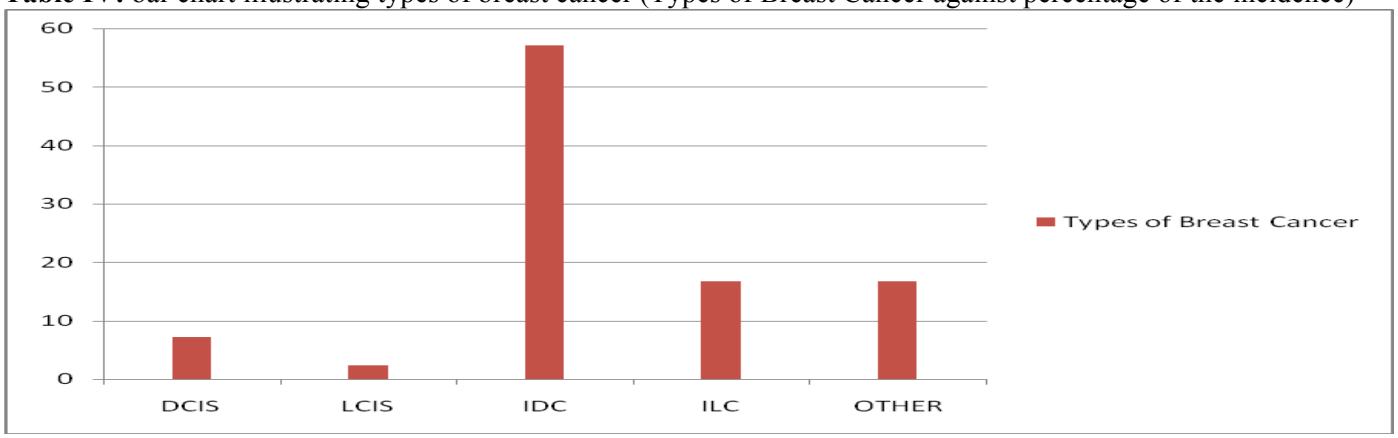
Table II: Age Distribution of Breast Cancer

Age	Frequency	Cumulative Frequency	Percentage of age
Under 20	10	10	2.38%
20-29	20	30	4.76%
30-39	80	110	19.05%
40-49	170	280	40.48%
50 and above	140	420	33.33%
Total	420	420	100

Table III: Histological Distribution of Breast Cancer

Type	Frequency	Percentage
Lobular carcinoma in situ	10	2.38%
Ductal carcinoma in situ	30	7.14%
Invasive ductal carcinoma	240	57.14%
Invasive lobular carcinoma	70	16.67%
Others	70	16.67%
Total	420	100%

Table IV: bar chart illustrating types of breast cancer (Types of Breast Cancer against percentage of the incidence)



Where:
DCIS = Ductal carcinoma in Situ
LCIS = Lobular Carcinoma in Situ
IDC = Invasive Ductal Carcinoma
ILC =Invasive Lobular Carcinoma

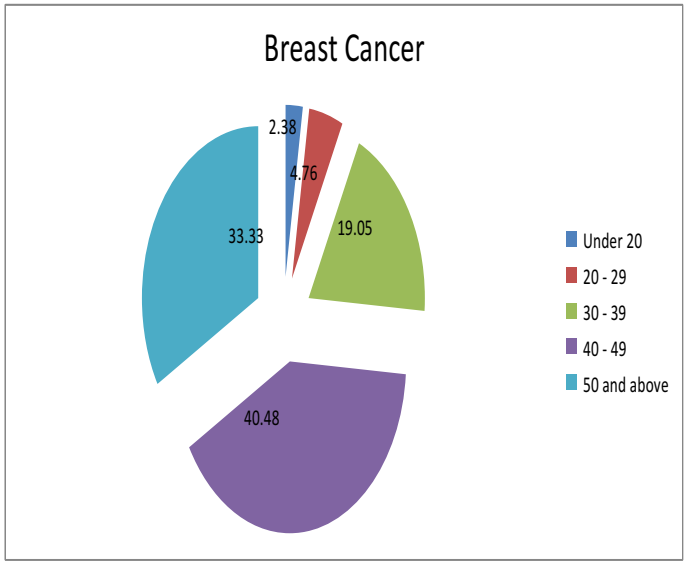


Table V pie: Chart of breast cancer illustrating age distribution against percentage incidence.

Figure 1 This is a normal breast tissue depicting subsegmental duct (arrow) giving rise to multiple terminal lobules(arrowheads) embedded in dense stroma. The areolar tissues are also shown.
Mag: x400
Stain: H&E

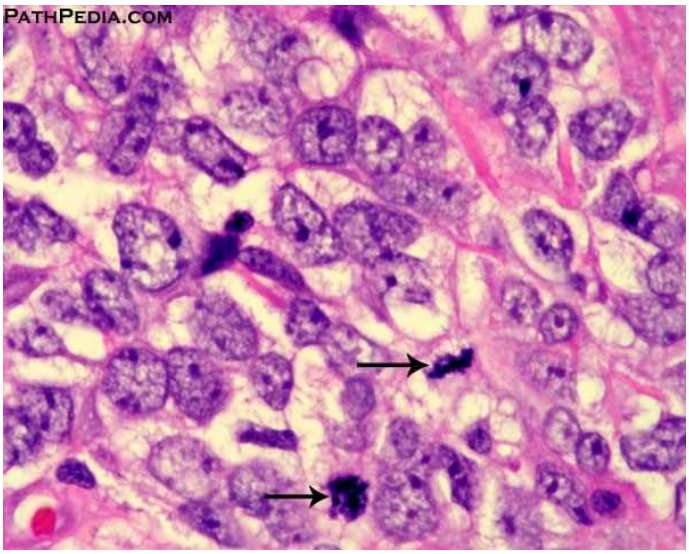


Figure 2 Breast tissue demonstrating a high grade invasive ductal carcinoma with mitoses (arrows). The number of mitoses in a particular count is used in the grading scheme. Here, the cancer cells show enlarged nuclei with prominent nucleoli.
Mag: x400 Stain: H&E

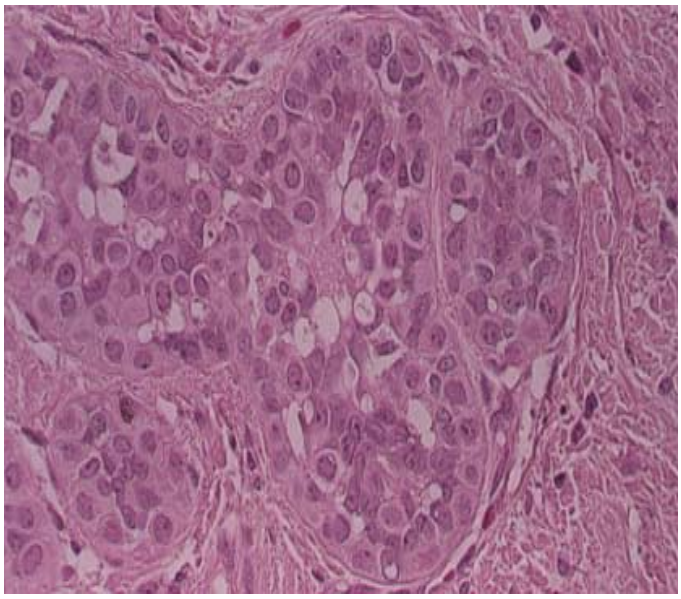


Figure 3 Breast tissue demonstrating invasive lobular carcinoma. The stromal cells as well as the cancer cells of the lobules are shown.
Mag: x400
Stain: H&E

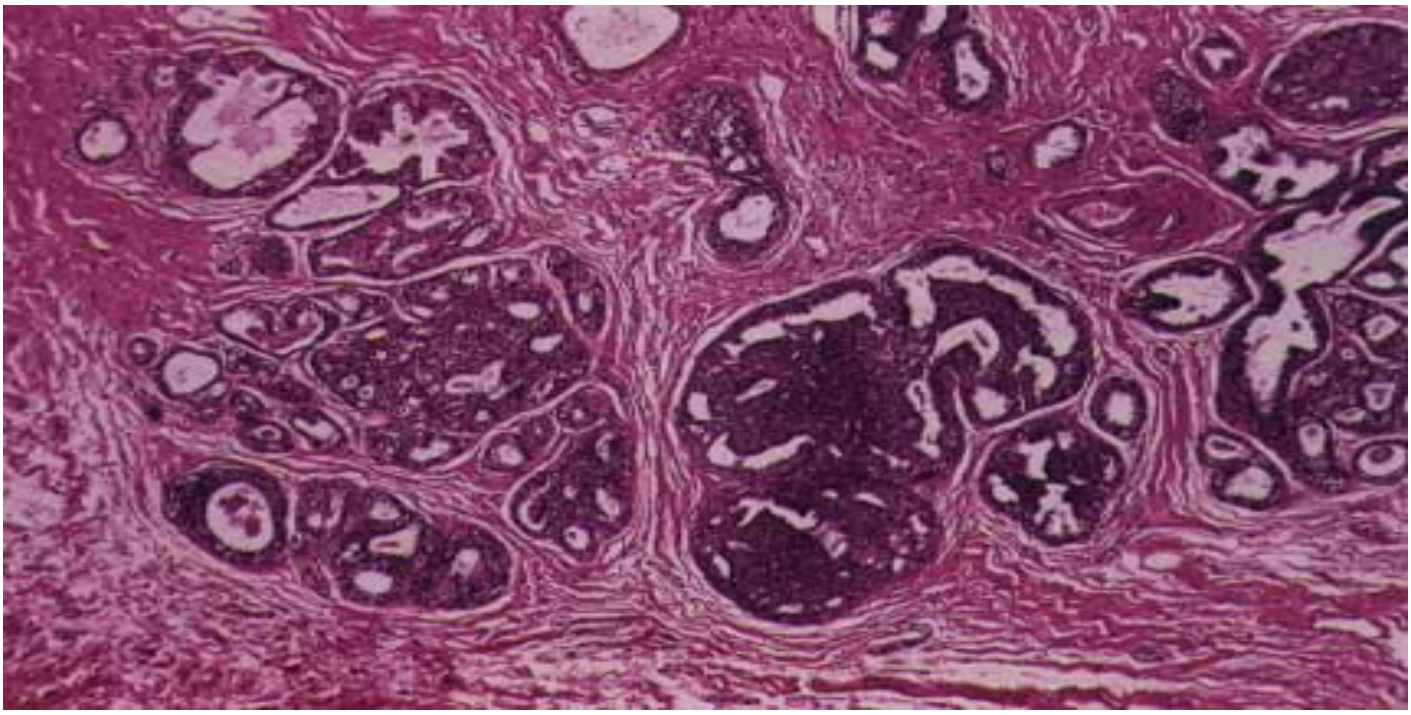


Figure 4 This is breast tissue demonstrating ductal carcinoma in situ. The stroma as well as the cancer cells are represented.
Mag: x400 Stain: H&E

4. Recommendation

Most women have the erroneous belief that breast feeding for a long period contributes to the change in firm nature of the breast, hence tend to wean their baby early enough so as to maintain the shape of the breast. This is a risk factor to breast tissue. Breast feeding for11/2 to 2 years help to reduce breast cancer. The increase in use of hormone replacement therapy/oral contraceptive, may be a contributory factor to the increase in prevalence, observed especially when the oral contraceptive is started early in life (teenage) before the first pregnancy. Reproductive factors occurring earlier in life (menarch) may be significant risk factor in the young age group. Other factors such as stress, pollutants, cosmetics, irregular exercise and poor feeding constitute a contributory factor, and however these are speculative. Most women with breast cancer seek medical help at the terminal stage of the disease. This may be a contributory factor to increased number of patient having invasive ductal carcinoma (IDC) as seen in the study. The results of this study suggest that breast cancer is increasing in Nigeria and needs an urgent intervention measure, preventive medicine is still preferable to curative in regard to cancer, women of all ages should be checked on medically on a regular basis.

5. Conclusion

Cancer cells are treatable if only detected early enough, our findings reveals that breast cancer is on the rise amongst women between the ages of 40-49. Conclusively, I think preventive medicine is still preferable to curative in regard to cancer.

Refernces

1. Whittemore A.S, Gong G., and John E.M. Prevalence of BRCA 1 Mutation carriers among U.S.A 2004, 13: 2078-2083. doi: 10.1007/s10549-008-0153-8
2. Haffty B, Silber A, and Matloff E. Racial differences in the incidence of BRCA 1 and BRCA2mutation2005,10:10781179.
3. Thull D.L, Vagel V. G, and Bloomer W.D. Recognition and management of hereditary Breast cancer syndrome U.S.A2004,9:1224 . https://www.ncbi.nlm.nih.gov
4. Fisher E.R., Land S.R and Fisher B. Pathologic finding from the National Surgical Adjuvant Breast and Bowel Project Cancers 2004; 100(2); 238-244. doi:10.1002/cncr.11883/full
5. Omar S, Khaled H, Gaafar R, Zekry AR, Eissa S, el-Khatib O. Breast cancer in Egypt: a review of disease presentation and detection strategies. East Mediterr Health J 2003; 9(3): 448-463 [PMID:15751939].https://www.ncbi.nlm.nih.gov/pubmed/15751939
6. Dobson R. Breast incidence in US has fallen for first time in 20 years. BMT2007;335;(7625); 849. doi: 10.1186/1741-7015-7-31
7. Meisner M.P.H., Angela L.W., Houma M., Fokrazad M.P., Melanie E and Royce M.D. Breast disease: Benign and malignant.Medical Journal of Clinical North American 2008; 92, 113-141. DOI: 10.1186/1750-1172-3-34
8. Thomas J. Cancer control in Africa: a call for action. Afr J Med Med Sci 2004; 33(1): 1-4 [PMID: 15490784] doi: 10.1093/jjco/hyt078.
9. Nggada HA, Yawe KD, Abdulazeez J, Khalil MA. Breast cancer burden in Maiduguri, North eastern Nigeria. Breast J 2008; 14(3): 284-286 [PMID: 18476884 DOI: 10.1111/j.1524-4741.2008.00576.x]
10. John A. Breast cancer prevalence less in Asian American among ethnic minorities. Women Health News 2007.
11. Adebomowo C.A and Ajayi O.O, Breast Cancer in Nigeria, West African Journal of Medicine 2006; (19); 179-191. DOI: 10.4103/1596-3519.55654
12. Mant C., Hodgson S., Hobdary R., D' Arrgo C.K and Cason J. A viral aetiology for breast cancer. Time to re-examine the postulate. Interviology 2004. 47; 2-13. DOI: 10.1159/ ... 1848
13. Dogo D., Gali B.M., All and Nggada H.A. Male Breast cancer in North Eastern Nigeria Nig. Journal of Clinical Practice 2006; 9 (2) 139-141. spjpbs.com/wp-content/uploads/.../Umunna-James-Ibeto-SPJPBS.2015.31254-260.pd
14. Jebbin NJ, Adotey JM. Metastatic carcinoma of the breast with inguinal lymph node

involvement: a report of two cases. Niger J Clin Pract 2008; 11(4): 383-385 [PMID: 19320417] https://www.ncbi.nlm.nih.gov/pubmed/17318976

15. Ochei J. and Kalhatkar A. Medical laboratory Science. Theory and Practice2007. 6th edition. Teta McGraw. Hill New Delhi pp 411-449. www.mheducation.co.in/9780074632239-india-medical-laboratory-sciencetheory-an
16. Adelusola K.A, Fadiran O.A, Adesunkani A.R.K and Odesanimi W.O Breast cancers in Nigeria women in Ile-Ife. Nigeria Medical Practitioner1996(12)31. europepmc.org/articles/pmc4659560b.

