Histopathological patterns of inflammation in benign and malignant prostatic diseases. Inflammation as risk factors for prostate cancer among Yemeni patients

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Abstract

Prostatic diseases are responsible for significant morbidity and mortality among adult males worldwide. Most frequently encountered diseases affecting prostate are prostatitis, benign prostatic hyperplasia (BPH) and prostatic cancer.

Paraffin blocks of prostatic tissues of 694 biopsies were selected retrospectively, from the private laboratories in Aden governorate – Yemen from January 2010 – March 2015. Hematoxylin and eosin slides for the corresponding paraffin-embedded formalin-fixed blocks were examined to identify and confirm the presence and type of inflammation in benign prostatic lesions, prostatic intraepithelial neoplasia and carcinoma. Data were entered to the SPSS program (version 22), obtaining frequencies, percentages and chi-square tests. The risk of malignancy associated with inflammation was estimated compared to those having non-inflammatory prostatic lesions. The tests were conducted with the 95% confidence interval and p-values of ≤ 0.05 were considered statistically significant.

Inflammation was found commonly in benign prostatic hyperplasia{*78.2%*}, in prostatic intraepithelial neoplasia {*7.7%*} and prostate cancer (*92.3%*}, most of which was chronic*($p<0.001$)*.The risk for malignant transformation was*2.98* times. Moderate, multifocal and stromal chronic inflammatory infitration was commonly seen in benign prostatic lesions. High grade prostatic cancer was observed in men who had inflammation.

Our findings revealed that chronic inflammation is a common finding in benign(particularly bengin prostate hyperplasia) and malignant prostate tissue among yemeni people. Chronic inflammation, in benign prostate tissue is associated with an increased risk of prostate cancer (>two folds).

Key words: Chronic inflammation, benign prostatic lesions, prostate cancer, Yemen.

Introduction

Prostatic diseases are responsible for significant morbidity and mortality among adult males worldwide. Most frequently encountered diseases affecting prostate are prostatitis, benign prostatic hyperplasia (BPH) and prostatic cancer[3].

In spite of progress in diagnosis and treatment, prostate cancer remains a major public health problem in the male population and the second leading cause of death among men in the United States and in many Western industrialized countries[18]. The exact etiology of prostatic carcinoma is largely unknown; this seems to be a multifactorial disease in which several environmental and genetic factors are likely to be involved[23].

Links between cancer and inflammation were first made in the nineteenth century, on the basis of observations that tumors often arose at sites of chronic inflammation and that inflammatory cells were present in biopsied samples from tumors[4].Recently, there has developed an expanding multidisciplinary body of literature suggesting a link between chronic inflammation and prostate cancer[14].

Chronic inflammation has long been linked to cancers with an infectious etiology,such as stomach, liver and colon cancer, in patients with inflammatory bowel disease[14].It is estimated that 20–25% of all human cancers are caused by chronic infection. Proliferation in the setting of longstanding chronic inflammation appears to predispose to carcinoma in the liver, large bowel, urinary bladder, and gastric mucosa[7,26].

Prostatic infection and chronic inflammation results in focal prostatic glandular atypia (e.g., prostatic intraepithelial neoplasia(PIN) and severe dysplasia), that may have a role in prostate carcinogensis[13].

Both chronic and acute inflammation are commonly observed in prostate tumor specimens from prostatectomies, transurethral resections of the prostate (TURP), and biopsy samples. Reactive molecules released by inflammatory cells, capable of interacting with DNA in the proliferating epithelium, may cause permanent genomic alterations such as rearrangements, deletions, and point mutations[6].

Inflammation is often histologically apparent in the examination of prostate specimens from older men. The causes of chronic prostatic inflammation as well as its putative role in carcinogenesis remain unclear[19].Previous studies have found both positive[20]and negative[29]associations between inflammation and incidence of prostate cancer. However, the nature of the association of chronic inflammation with prostate cancer is a matter of controversy and still holds unsettled.

However, little is known about the presence of inflammation in prostate tissue specimens in Yemeni men. In Yemen, Aden governorate no study has, been undertaken to document the histopathological patterns of inflammation in prostatic lesions and the risk of prostatic inflammation in relation to prostate cancer.

Objective:

The aim of the study is to investigate the frequency of inflammatory infiltration in prostatic lesions, in patients who were referred to private laboratory from *January 2010 – March 2015*.

Materials and methods

Paraffin blocks of prostatictissue of six hundred ninety four biopsies were selected retrospectively, form the private laboratories in *Aden governorate – Yemen from January 2010 – March 2015*. Hematoxylin and eosin slides for the corresponding paraffin-embedded formalin-fixed blocks were examined to identify and confirm the presence and type of inflammation, either acute or chronic in benign prostatic lesions, prostatic intraepithelial neoplasia and carcinoma.Acute and chronic inflammation were graded as mild, moderate or severe when the area of nonneoplastic prostate tissue covered by inflammatory cells was 10% or less, ≥10% - 20%, and ≥20%, respectively[24]. According to the extent and site, inflammation was graded as Focal, multifocal and diffuse; acinar, periacinar and stromal, respectively[19]. Focal prostate atrophy was characterized according to the atrophy classification, proposed in 2006 by the Working Group for Histologic Classification[9]. Diagnostic and favoring features of malignancy according to Epstein, (15) and Veliekovle et al., (31) were followed. Prostatic carcinoma was graded by Gleason grading system (Amin et al., 2).

Sections from the six hundred ninety-four resection specimens were microscopically examined to identify inflammation in benign lesions, high gradeprostatic intraepithelial neoplasia(HGPIN) and cancer. The 694 cases were catagorized into 3 groups:

The first group included 211 (*30.4%*) inflammation in benign prostatic lesions, those benign glands were carefully examined to exclude criteria of malignancy, *the second group* was diagnosed as inflammation associated with prostatic intraepithelial neoplasia and inflammation associated with prostate cancer. This group represented 155 cases *(22.3 %)* of the total specimens and the *third group* (Control group) represented 328 cases *(47.3%)* of the total specimens.265*(80.8%)* cases benign prostatic lesion without inflammation and 63(*19.2%*) cases of malignancy without inflammation.

Statistical analysis:

Data were double entered to the SPSS program (version 22), obtaining frequencies, percentages and chi-square tests. The risk of malignancy associated with inflammation was estimated in compare to those having non-inflammatory prostatic lesions. The tests were conducted with the 95% confidence interval and p-values of ≤ 0.05 were considered statistically significant.

Results:

Our analysis included six hundred ninety four prostate resections pecimens of inflammation in benign, HGPIN and malignant.

In our study, all benign tissue specimens were evaluated for the presence of inflammation. Inflammations in benign prostatic lesions were found in:benign prostatic hyperplasia{N=165, *78.2%*}**(Fig.1)**, Benign prostatic hyperplasia with focal prostatic atrophy {N= 11, *5.2%*}, Basal cell hyperplasia {N= 5, *2.4%*}**(Fig.2)**, Simple atrophy with cystic formation {N= 15, *7.1%*}**(Fig.3,4)**, Benign prostatic hyperplasia with atypical adenoumatous hyperplasia {N=7, *3.3%*} and post atrophic hyperplasia {N= 8, *3.8%*}**(Fig.5)**. Inflammation also was detected in prostatic intraepithelial neoplasia {N= 12, *7.7%*} **(Fig.6,7)**and prostate cancer (N= 143, *92.3%*}.**(Table 1)(Fig.8)**

The studied patients with prostatic lesions showed inflammatory lesions more than non-inflammatory lesions *(52.7% vs. 47.3%)*,predominantly chronic*($p<0.001$)***(Fig.9)**. There is significant statistical association between the type of prostatic lesion (benign or malignant) and the type of inflammation (p<0.001). In both groups; the benign as well as the malignant prostatic lesions, it is found that chronic inflammation was predominant*(53.5%)* and *(46.5%)* respectively.**(Table 2)**

The studied inflammatory prostatic lesions showed a significant risk for malignant transformation of *2.98* times when compared to the non-inflammatory prostatic lesions. **(Table 3)**

Evaluation of the grade, extent and location of chronic prostatic inflammation showed significant association to the type of prostatic lesions *($p<0.001$)*,while in acute inflammatory prostatic lesions there was no significance association*($p>0.05$)*. Moderate grade was higher in benign lesions*(35.4%),* while severe grade was slightly higher in malignant than benign lesions*(17.8%)(16.1%)***(Table 4)**.Multifocal chronic lesions were found higher in benign lesions*(37.3)*, while diffuse chronic lesions were found higher in malignant prostatic lesions*(21.5%)* compared with benign lesions**(Table 5)**. High significant association *($p=0.0001$)*was observed between periacinar chronic inflammation in benign*(11.1%)*& malignant*(18.4%)* prostatic lesions. Stromal chronic inflammatory lesions were found higher in benign*(34.8%)*.Stromal chronic inflammation was high in benign as well as malignant prostatic lesions, compared to the acinar and periacinar inflammation. **(Table 6)**.

When the 143 malignant prostatic lesions were scored for carcinoma, high percentages were found in score 8*(27.3%)*, 2*(23.8%)*and3*(15.4)***(Table 7)**.

Table 1: Overall distribution of inflammation in different prostatic lesions in prostatic specimens.

Table 1. Overall distribution of inflammation in different prostatic lesions in prostatic specimens (n= 366)		
Prostatic lesions	No	**%**
Benign prostatic hyperplasia	165	78.2
Benign prostatic hyperplasia with focal prostatic atrophy.	11	5.2
Basal cell hyperplasia.	5	2.4
Simple atrophy with cystic formation.	15	7.1
Benign prostatic hyperplasia with atypical adenoumatous Hyperplasia.	7	3.3
Post atrophic hyperplasia.	8	3.8
Total	**211**	**100.0**
Prostatic intraepithelial neoplasia	12	7.7
Prostate cancer (No= 143, *92.3%*}.	143	92.3
Total	**155**	**100.0**

Table 2: Distribution of the studied patients with prostatic lesions.

Table 2. Distribution of the studied patients with prostatic lesions								
Prostatic lesion	Inflammatory lesions				Non inflammatory lesions		Total	
	Acute inflammation		Chronic inflammation					
	№	%	№	%	№	%	№	%
Benign	42	84.0	169	53.5	265	80.8	476	68.6
Malignant	8	16.0	147*	46.5	63	19.2	218*	31.4
Total**	50	7.2	316	45.5	328	47.3	694	100.0

* Included 12 patients with intraepithelial neoplasia.
**Percentages calculated from the total of row, while others by column.(Inflammatory lesions= 7.2+45.5=52.7%)
Chi square test [$\chi^2 = 61.7$, $p = 0.0001$] statistically significant.

Table 3: Risk of malignancy associated with inflammatory prostatic lesions.

Table 3. The risk of malignancy associated with inflammatory prostatic lesions					
Prostatic lesion	Benign prostatic lesions (n= 476)	Malignant prostatic lesions (n= 218)	Statistics		
	№ (%)	№ (%)	*p*	OR	95% CI
Non inflammatory	265 (80.8%)	63 (19.2%)	<0.001	1	
Inflammatory	211 (57.7%)	155 (42.3%)*		**2.98**	2.11 – 4.21

* Included 12 patients with intraepithelial neoplasia.
OR: Odds ratio CI: Confidence interval 1: Indicates the reference group.

Table 4: Grade of inflammation in the studied patients with prostatic lesions.

Table 4. The grade of inflammation in the studied patients with prostatic lesions							
Prostatic lesion	Acute inflammation (n = 50)			Chronic inflammation (n = 316)			Total (n = 366)
	Mild	Moderate	Severe	Mild	Moderate	Severe	
	№ (%)	№ (%)	№ (%)	№ (%)	№ (%)	№ (%)	№ (%)
Benign	8 (16.0)	24 (48.0)	10 (20.0)	6 (1.9)	112 (35.4)	51 (16.1)	211 (57.7)
Malignant	0 (0.0)	3 (6.0)	5 (10.0)	19 (6.0)	72 (22.8)	56 (17.8)	155* (42.3)
Chi-square test	χ^2= 5.36,[a] *p*= 0.069			χ^2= 14.2,[b] *p*= **0.001****			χ^2= 33.9[c] *p*=**0.0001****

* Included 12 patients with intraepithelial neoplasia with chronic inflammation.
Percentages were calculated from the total of acute or chronic inflammation.
[a] chi square test for acute inflammation [b] chi square test for chronic inflammation
[c] chi square test for acute and chronic inflammation **statistically significant

Table 5: Extent of inflammation in the studied patients with prostatic lesions.

Table 5. The extent of inflammation in the studied patients with prostatic lesions							
Prostatic lesion	Acute inflammation (n = 50)			Chronic inflammation (n = 316)			Total (n=366)
	Focal	Multifocal	Diffuse	Focal	Multifocal	Diffuse	
	№ (%)	№ (%)	№ (%)	№ (%)	№ (%)	№ (%)	№ (%)
Benign	5 (10.0)	25 (50.0)	12 (24)	7 (2.2)	118 (37.3)	44 (13.9)	211 (57.7)
Malignant	0 (0.0)	5 (10.0)	3 (6.0)	5 (1.6)	74 (23.3)	68 (21.5)	155* (42.3)
Chi-square test	χ^2= 1.14,[a] p= 0.565			χ^2= 14.1,[b] p= **0.001****			χ^2= 31.5[c] p=**0.0001****

* Included 12 patients with intraepithelial neoplasia with chronic inflammation.
Percentages were calculated from the total of acute or chronic inflammation.
[a] chi square test for acute inflammation [b] chi square test for chronic inflammation
[c] chi square test for acute and chronic inflammation **statistically significant

Table 6: Location of inflammation in the studied patients with prostatic lesions.

Table 6. The location of inflammation in the studied patients with prostatic lesions							
Prostatic lesion	Acute inflammation (n = 50)			Chronic inflammation (n = 316)			Total (n=366)
	Acinar	Periacinar	Stromal	Acinar	Periacinar	Stromal	
	№ (%)	№ (%)	№ (%)	№ (%)	№ (%)	№ (%)	№ (%)
Benign	11 (22.0)	12 (24.0)	19 (38.0)	24 (7.6)	35 (11.1)	110 (34.8)	211 (57.7)
Malignant	0 (0.0)	2 (4.0)	6 (12.0)	7 (2.2)	58 (18.4)	82 (25.9)	155* (42.3)
Chi-square test	χ^2= 3.32,[a] p= 0.190			χ^2= 17.6,[b] p= **0.0001****			χ^2=36.3[c] p=**0.0001****

* Included 12 patients with intraepithelial neoplasia with chronic inflammation.
Percentages were calculated from the total of acute or chronic inflammation.
[a] chi square test for acute inflammation [b] chi square test for chronic inflammation
[c] chi square test for acute and chronic inflammation **statistically significant

Table 7: Score of carcinoma with inflammatory prostatic lesions.

Table 7. The score of carcinoma with inflammatory prostatic lesions		
Prostatic lesion	(n= 143)*	
	№	%
2	34	*23.8*
3	22	*15.4*
4	7	4.9
5	4	2.8
6	9	6.3
7	10	7.0
8	39	*27.3*
9	11	7.7
10	7	4.9
*Excluding 12 patients with intraepithelial neoplasia with chronic inflammation.		

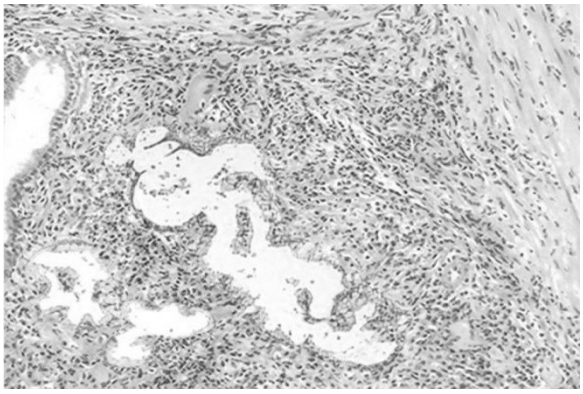

Fig (1): Photomicrography of benign prostatic hyperplasia showing chronic, severe, diffused and stromal inflammatory cells infiltration (H and E) (X100).

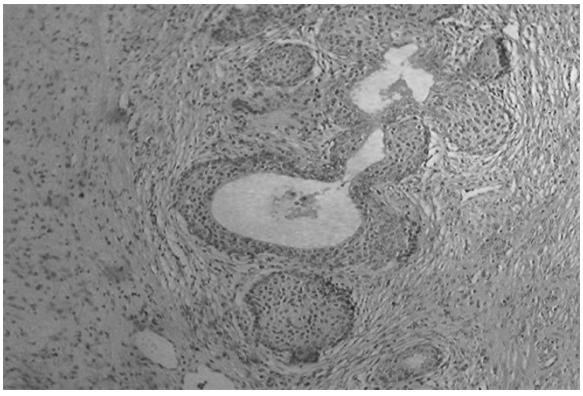

Fig (2): Photomicrography of basalcell hyperplasia showingchronic, moderate and stromal inflammatory cells infiltration(H and E) (X200).

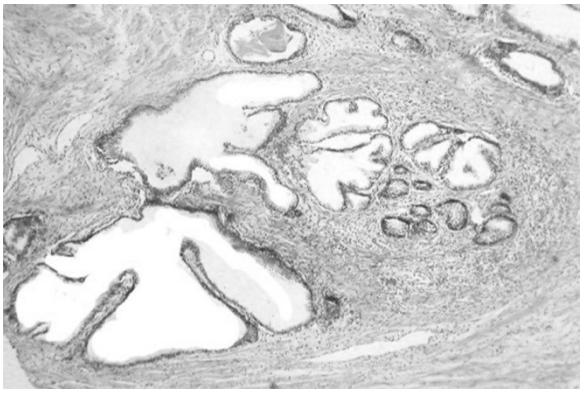

Fig (3): Photomicrography of simple atrophy with cystic formation showingchronic, severe, multifocal and stromal inflammation (H and E) (X100).

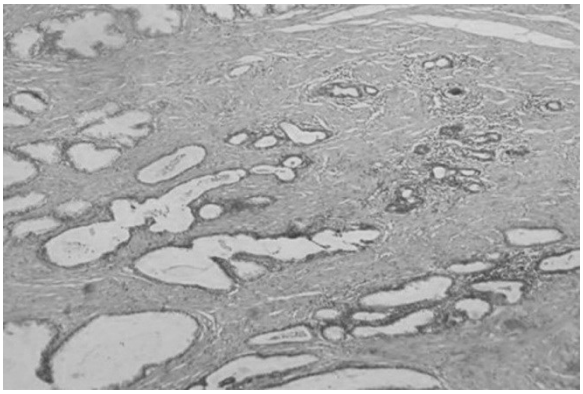

Fig (4): Photomicrography of simple atrophic lesion with cystic formationshowingchronic, severe, multifocal and stromal inflammatory cells infiltration around suspicious glands for malignancy (H and E) (X100).

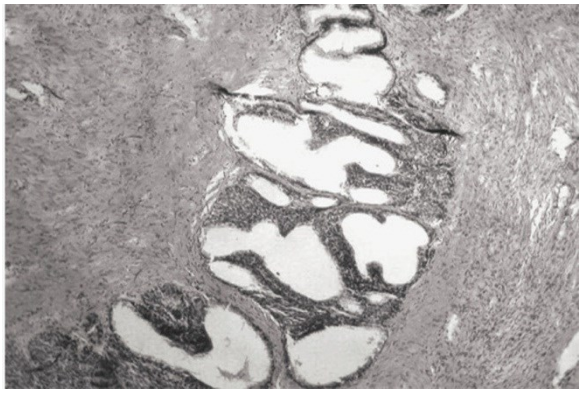

Fig (5): Photomicrography of prostatic intraepithelial neoplasia showing chronic, severe, diffused and stromal inflammatory cells infiltration(H and E) (X100).

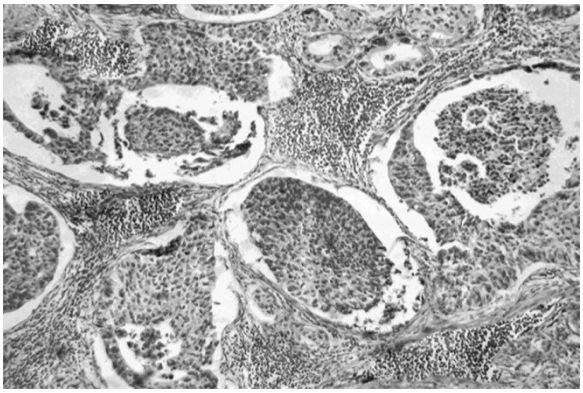

Fig (6): Photomicrography of cribriform prostatic intraepithelial neoplasia showing chronic, severe, diffused,acinar, periacinar and inflammatory cells infiltration(H and E) (X100).

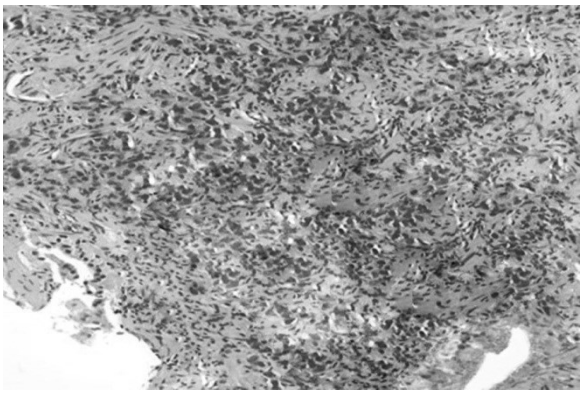

Fig (7): Photomicrography of chronic, severe, diffused and stromal inflammatory cells infiltration in high grade prostatic cancer(H and E) (X100).

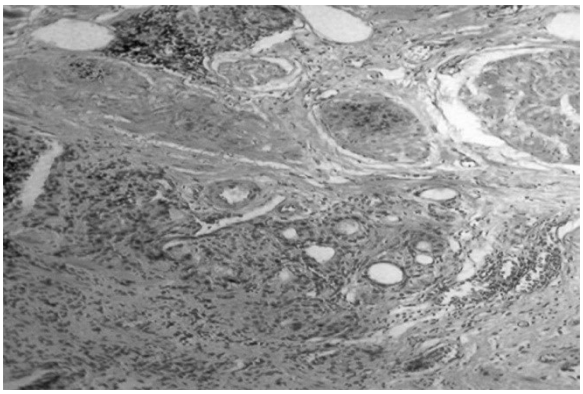

Fig (8): Photomicrography showing chronic, moderate, multifocal and stromal inflammation (H and E) (X100).

Discussion

Inflammation of the prostate may represent a mechanism for hyperplastic changes to occur in the prostate[8,14].The role of infection/inflammation in the initiation and progression of cancer has been an area of intense scientific interest and is usually considered from the perspective that persistent inflammation in the context of chronic infection or tissue injury might promote cell transformation through DNA damage or that tumor cells produce pro-inflammatory factors that derive chronic inflammation and tumor growth[27, 32].

In the line with earlierstudies, our results revealed that inflammation were found in benign prostatic lesions among Yemeni people as benign prostatic hyperplasia{N=165, *78.2%*}, Benign prostatic hyperplasia with focal prostatic atrophy {N= 11, *5.2%*}, Basal cell hyperplasia {N= 5, *2.4%*}, Simple atrophy with cystic formation { N= 15, *7.1%*}, Benign prostatic hyperplasia with atypical adenoumatous Hyperplasia {N=7, *3.3%*} and post atrophic hyperplasia { N= 8, *3.8%*}. Inflammation also was detected in prostatic intraepithelial neoplasia {N= 12, *7.7%*} and prostate cancer (N= 143, *92.3%*}[1,6,7,11,13,14,21,22,26,28,30,32].Benign prostate hyperplasia(BPH) represented the common benign prostatic lesion associated with inflammation with an incidence of 78.2%. Chronic inflammation in benign prostatic hyperplasia have been described previously[16,28]. Robert et al. 2009 and Al-Samawi et al. 2014,also documented that inflammation was found in 50% and 23.2% respectively of all biopsies reviewed, associated with benign prostatic hyperplasia.From a pathophysiologic standpoint, tissue damage associated with inflammatory response and subsequent chronic tissue healing may result in the development of BPH nodules and proliferative inflammatory atrophy (PIA), which may be responsible, in patients with genetic predisposition, for the transition into high-grade intraepithelial neoplasia (HGPIN) and prostate cancer[17,25].

Our investigation revealed that chronic inflammation was found in benign prostatic lesions as well as in malignant lesions. Previous studiesobserved that inflammation, most of which chronic, was common in benign prostate tissueand waspositively associated with prostate cancer[1,5,16,21,25].

In this studyis found that chronic inflammation in benign prostatic lesionswere associated with more than twofold increase risk for prostate cancer.Previous studies have generally investigated the relationship of inflammation with prostate cancer. Gurel et al.2014 reported that the odds of prostate cancer were higher in men who had inflammation in their benign prostate tissuethan men who had zero cores with inflammation.Elkahwaji et al.2009,suggested that chronic prostatic inflammation may be a major factor in predisposition to prostatic carcinogenesis.Epidemiologic, histopathology, and molecular pathologic studies provide the emerging evidence of the possible role of prostatic inflammation as acrucial part of prostate cancer pathogenesis and progression[5, 12].

Elkahwaji et al.2009demonstrated that prostatic inflammation results in focal prostatic glandular atypia (e.g., PIN and severe dysplasia), a potential precursor of prostatic adenocarcinoma. In addition, their results suggested a potential relationship between chronic inflammation and oxidative DNA damage that may have a role in prostate carcinogenesis.Overall, these results showedthat chronic prostatic inflammation may be a major factor in predisposition to prostatic carcinogenesis.De Nunzio et al.2011 reported that chronic prostatic inflammation may be involved in the development and progression of chronic prostatic disease, such as benign prostate hyperplasia and prostate cancer. A great deal of literature has addressed the role of genetic polymorphisms in inflammation pathways and the production of inflammatory cytokines with regard to prostate cancer risk and promotion[22,26].In contraryto the Terakawaet al.2008, who demonstrated that absence of chronic inflammation was associated with increased risk for prostate cancer.Kryvenkoet al.2012, and Porcaro et al.2014, also reported that there was an inverse association of chronic inflammation of the prostate and risk of prostate cancer. Thedifference might be attributed toa number of patients studied, differences of prevalence or susceptibility to risk factors.

Evaluation of the grade, extent and the location of chronic inflammatory cells infiltration showed that moderate, multifocal and stromal chronic inflammatory infiltration were commonly seen in benign prostatic lesions,while, severe, diffuse, periacinar to stromal chronic inflammation was commonly found in malignant prostatic lesion. These findings are similar with reports documented by Davidsson et al.(10) and Gurel et al.(16), while, Kryvenko et al.(19), found that the grade and extent of inflammation was inversely associated with cancer risk.

Prostatic carcinoma was graded according to the Gleason's scoring. Notably, in our current study, 8 score,was the commonest among those malignant cases that have chronic inflammation. High grade prostatic cancer was observed in men who had inflammation. Inflammation in and around prostate cancer is associated with worse disease outcome.Chronic inflammation in benign tissue of a patient biopsy was predictive of a higher risk for prostate cancer diagnosis and specifically, with higher-grade (Gleason score 7–10) disease[1,6, 17,25].

Conclusion

Our findings revealed that chronic inflammation is a common finding in benign(particularly benign prostate hyperplasia)and malignant prostate tissue among Yemeni people. Chronic inflammation, in benign prostate tissue is associated with an increased risk of prostate cancer (> two folds).Additional studies are necessary in order to investigate a linkage between inflammation and etiology of prostate cancer among Yemeni population.

References:

1- Al-Samawi AS and Aulaqi SM(2014):The Histopathological patterns of prostatic diseases and prostatic cancer in Yemeni patients. *Sana'a univ j med sci*;6 (1): 7-12.
2- Amin MB, Grignon DJ, Humphrey PA, editors(2004): Contemprary application of Gleason grading in 18-gauge needle biopsy, teransurethralreseaction and radical prostatectomy specimens. In: Gleason grading of prostate cancer: Amin MB, Grignon DJ, Humphrey PA and Strigley JR(ed).*Philadelphia: Lippincott Williams &Wilkins*;13-60.
3- Anunobi CC, Akinde OR, Elesha SO, Daramola AO, Tijani KH and Ojewola RW(2011): Prostate Diseases in Lagos, Nigeria: a histologic study withtPSA correlation. *Nigerian Post grad Med J*;18: 98-104.
4- Balkwill F and Mantovani A(2001): Inflammation and cancer: back to Virchow?.*Lancet*;357: 539– 45
5- Briganti A, Capitanio U, Suardi N, Gallina A, Guazzoni G and Montorsi F(2009): Benign prostatic hyperplasia and its aetiologies.*EurUrol*;8:865–71.
6- Davidsson S, Fiorentino M, Andrén O. Fang F, Mucci LI, Varenhorst E and Rider JR (2011): Inflammation, Focal Atrophic Lesions, and Prostatic Intraepithelial Neoplasia with Respect to Risk of Lethal Prostate Cancer. *Cancer Epidemiol Biomarkers Prev*;20: 2280-5.
7- De Marzo AM, Marchi VL, Epstein JI and Nelson WG(1999): Proliferative Inflammatory Atrophy of the Prostate: Implications for Prostatic Carcinogenesis.*Am J Pathol*;155(6):1985–92.
8- De Marzo AM, Nakai Y, Nelson WG(2007): Inflammation, atrophy, and prostate carcinogenesis.*UrolOncol*;25(5):398–400.
9- De Marzo AM, Platz EA, Epstein JI(2006) :A working group classification of focal prostate atrophy lesions.*Am J SurgPathol*; 30(10):1281-91.
10- De Nunzio C, Kramer G, Marberger M,Montironi R, Nelson W, Schröder F, Sciarra A and Tubaro A (2011): The controversial relationship between benign prostatic hyperplasia and prostate cancer: the role of inflammation. *EurUrol*;60(1):106-17.
11- Di Silverio F, Gentile V, De Matteis A, Mariotti G, Giuseppe V, Luigi PA and Sciarra A (2003): Distribution of inflammation, pre malignant lesions, and Incidental carcinoma in histologically confirmed benign prostatic hyperplasia: AretrospectiveAnalsis.*EurUrol*;34: 164-75.
12- Drake CG(2010): Prostate cancer as a model for tumour immunotherapy. *Nat Rev Immunol*;10:580–93.

13- Elkahwaji JE, Hauke RJ and Brawner CM (2009): Chronic bacterial inflammation induces prostatic intraepithelial neoplasia in mouse prostate. *Br J Cancer*;101: 1740–8.
14- Elkahwaji JE (2013): The role of inflammatory mediators in the development of prostatic hyperplasia and prostate cancer.*Res Rep Urol*;5: 1–10.
15- Epstein JI (2004): Diagnosis and reporting of limited adenocarcinoma of prostate on needle biopsy. *Mod Pathol*; 17: 307-315.
16- Gurel B, Scott Lucia M,Thompson M, Goodman PJ, Tangen CM, Kristal AR, Parnes HL,Lippman SM, Sutcliffe S, Peskoe SB, Drake CG,Nelson WG; De Marzo AM and Platz EA (2014): Chronic inflammation in benign prostate tissue is associated with high-grade prostate cancer in the placebo arm of the Prostate Cancer Prevention Trial.*Cancer Epidemiol Biomarkers Prev*;23(5): 847–56.
17- Hughes C, Murphy A, Martin C, Sheils O and O'Leary J (2005): Molecularpathology of prostate cancer. *J ClinPathol*;58:673–84.
18- Jemal A, Siegel R, Ward E, Hao Y, Xu J, Murray T, Thun MJ (2008): Cancer statistics. *CA Cancer J Clin*;58(2): 71–96.
19- Kryvenko ON, Jankowski N, Chitale DA. Tang D, Rundle A, Trudeau Sand Rybicki BA (2012): Inflammation and preneoplastic lesions in benign prostate as risk factors for prostate cancer.*Mod Pathol*;25(7): 1023–32.
20- MacLennan GT, Eisenberg R, Fleshman RL, Taylor M, Fu P, Resnick MI and Gupta S (2006): The influence of chronic inflammation in prostatic carcinogenesis: a 5-year followup study.*J Urol* 2006, 176:1012–16.
21- Mansoor I (2003): Pattern of prostatic diseases in Saudi Arabia. *Int J Pathol*;2:2-12.
22- Mantovani A, Allavena P, Sica A and Balkwill F (2008): Cancer-related inflammation. *Nature*;454:436–44.
23- Migliore L and Coppede F (2002): Genetic and environmental factors in cancer and neurodegenerative diseases.*Mutat Res*;512: 135–53.
24- Nickel JC, Nyberg LM, Hennenfent M (1999): Research guidelines for chronic prostatitis: Consensus report from the first national institutes of health international prostatitis collaborative network, for the international prostatitis collaborative network.*J Urol*; 54: 229–233.
25- Nonomura N, Takayama H, Nakayama M, Nakai Y, Kawashima A, Mukai M, Nagahara A, Aozasa K and Tsujimura A (2011): Infiltration of tumor-associated macrophages in prostate biopsy specimens is predictive of disease progression after hormonal therapy for prostate cancer. *BJU Int*;107:1918–22.
26- Platz E.A, and De Marzo A (2004): Epidemiology of Inflammation and Prostate Cancer. *J Urol*; 171(2): S36–S40.
27- Porcaro AB, Rubilotta E, Petrozziello A,Ghimenton C, Migliorini F, Zecchini Antoniolli S, Lacola V, Monaco C, Curti P, Cavalleri S, Pianon R and Artibani W (2014): Chronic inflammation of the prostate type IV with respect to risk of prostate cancer. *Arch ItalUrolAndrol*;86(3): 208–11.
28- Robert G, Descazeaud A and Allory Y (2009): Should We investigate prostatic inflammation for the management of benign prostatic hyperplasia?.*EurUrolSuppl*;8 (13): 879- 86.
29- Terakawa T, Miyake H, Kanomata N, Kumano M, Takenaka A, Fujisawao M (2008): Inverse association between histologic inflammation in needle biopsy specimens and prostate cancer in men with serum PSA of 10-50 ng/mL.*J Urol*;72:1194–7.
30- Umbehr MH, Gurel B, Murtola TJ,Sutcliffe S, Peskoe SB, Tangen CM, Goodman P, Thompson IM, Lippman SM, Lucia MS, Parnes HL, Drake CG, Nelson WG, De Marzo AM and Platz EA (2015):Intraprostatic inflammation is positively associated with serum PSA in men with PSA o4 ngml − 1, normal DRE and negative for prostate cancer. *Prostate Cancer Prostatic Dis*;18: 264– 9.
31- Veliekovle L, Katle V, Tasledimov D,Dimov D, Dordeviae B, Zivkovic V, Zivkovic S and Marjanovic G (2004): Morphologic criteria for the diagnosis of prostatic adenocarcinoma in needle biopsies. *Arch Oncol*;12(1): 54-5.
32- Vindrieux D, Escobar P and Lazennec G (2009): Emerging roles of chemokines in prostate cancer. *EndocrRelat Cancer;* 16: 663–73.

الطراز النسيجي المرضي لالتهاب البروستاتا في الأمراض الحميدة والسرطانية- التهاب البروستاتا كعامل خطر لسرطان البروستاتا عند المرضى اليمنيين

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الملخص

تعد أمراض البروستاتا أحد الأسباب الرئيسية للوفيات في العالم، ومن أهمها التهاب البروستاتا، تضخم البروستاتا الحميد وسرطان البروستاتا.

استعملت في هذه الدراسة عينات ل 694 مريض تم تجميعها من مختبرات خاصة في محافظة عدن في الفترة من يناير 2010-مارس 2015م وصبغت هذه العينات بمادة الهيمتوكسيلين أيوسين لفحصها وتحديد أنواع الالتهاب في عينات أمراض البروستاتا الحميدة والسرطانية.

وخلال الفحص لوحظ وجود الالتهابات في تضخم البروستاتا الحميد بنسبة 78.2% وفي السرطان الابد (في موضعه) 7.7% وفي سرطان البروستاتا 92.3% وهي التهابات من النوع المزمن. ولوحظ أيضا أن معمل الخطر لتحول الأورام الحميدة المصاحبة للالتهابات إلى أورام سرطانية كانت 2.98% وأهمها الالتهابات المزمنة المتوسطة ، عديدة البؤر السدوية. وأشارت نتائج الدراسة إلى أنَ السرطانات المصاحبة للالتهابات المزمنة كانت من النوع المتقدم.

الكلمات المفتاحية: التهاب المزمن للبروستاتا، أذى بروستاتي حميد، سرطان البروستاتا، اليمن.