

**HUBUNGAN EKSPRESI TRANSFORMING GROWTH FACTOR-BETA (TGF- $\beta$ )  
DENGAN INVASI LIMFOVASKULAR DAN KETERLIBATAN KELENJAR GETAH  
BENING PADA KARSINOMA KOLOREKTAL**

**TESIS**



**PROGRAM STUDI PATOLOGI ANATOMIK PROGRAM SPESIALIS FAKULTAS  
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**Hubungan Ekspresi *Transforming Growth Factor-Beta* (TGF- $\beta$ )  
dengan Invasi Limfovaskular dan Keterlibatan Kelenjar Getah Bening pada  
Karsinoma Kolorektal di RSUP DR. M. Djamil Padang**

**ABSTRAK**

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**Pendahuluan:** Karsinoma kolorektal adalah kanker dengan kejadian paling sering ketiga dan penyebab kematian akibat kanker kedua secara global. Angka kelangsungan hidup 5 tahun pada pasien dengan karsinoma kolorektal dapat mencapai 90% jika tumor terdiagnosis dan segera diobati pada stadium awal, tetapi angka ini menurun secara drastis menjadi 14% ketika tumor baru terdiagnosis. *Transforming Growth Factor- $\beta$*  (TGF- $\beta$ ) memainkan peran penting dalam tumorigenesis, perkembangan tumor dengan menstimulasi *Epithelial-To-Mesenchymal Transition* (EMT), proliferasi sel, invasi, metastasis, angiogenesis, dan penghindaran sistem imun. Invasi limfovaskular dianggap sebagai langkah penting dalam perkembangan metastasis kelenjar getah bening dan penyebaran sistemik sel kanker.

**Metode:** Penelitian ini merupakan penelitian observasional dengan pendekatan *cross sectional*. Sampel blok paraffin di laboratorium Patologi Anatomi RSUP Dr. M. Djamil Padang dari kasus karsinoma kolorektal yang menjalani tindakan operasi reseksi periode Januari 2023-Desember 2023 sebanyak 50 kasus. Analisis bivariat dilakukan dengan uji *Chi-square* dengan hasil uji statistik dianggap bermakna jika  $p < 0,05$ .

**Hasil:** Invasi limfovaskular positif pada karsinoma kolorektal dengan *high expression* TGF- $\beta$  sebesar 73,52%, sedangkan *low expression* 31,25%. Analisis statistik menunjukkan adanya hubungan yang bermakna antara ekspresi TGF- $\beta$  dengan invasi limfovaskular ( $p=0.011$ ). Karsinoma kolorektal dengan keterlibatan kelenjar getah bening yang positif menunjukkan TGF- $\beta$  yang *high expression* sebesar 47,05% dan *low expression* 6,25%. Penelitian ini terdapat hubungan antara ekspresi TGF- $\beta$  dengan keterlibatan kelenjar getah bening karsinoma kolorektal ( $p=0.012$ ).

**Kesimpulan:** Terdapat hubungan yang bermakna antara ekspresi TGF- $\beta$  dengan invasi limfovaskular dan keterlibatan kelenjar getah bening pada karsinoma kolorektal.

**Kata kunci:** Karsinoma Kolorektal; Ekspresi TGF- $\beta$ ; Invasi Limfovaskular; Kelenjar Getah Bening

**The Association of Transforming Growth Factor-Beta (TGF- $\beta$ )  
Expression with Lymphovascular Invasion and Lymph Node Involvement  
of  
Colorectal Carcinoma in RSUP DR. M. Djamil Padang**

**ABSTRACT**

Julpa Nurul Aini

**Introduction:** Colorectal carcinoma is the third most common cancer and the second leading cause of cancer death globally. The 5-year survival rate in patients with colorectal carcinoma can reach 90% if the tumor is diagnosed and treated promptly at an early stage, but this figure decreases drastically to 14% when the tumor is newly diagnosed. Transforming Growth Factor- $\beta$  (TGF- $\beta$ ) plays an important role in tumorigenesis, tumor development by stimulating Epithelial-To- Mesenchymal Transition (EMT), cell proliferation, invasion, metastasis, angiogenesis, and immune system evasion. Lymphovascular invasion is considered an important step in the development of lymph node metastasis and systemic spread of cancer cells.

**Methods:** This study is an observational study with a cross-sectional approach. Paraffin block samples in the Anatomical Pathology Laboratory of Dr. M. Djamil Padang Hospital from colorectal carcinoma cases undergoing resection surgery from January 2023 to December 2023 were 50 cases. Bivariate analysis was performed using the Chi-square test with statistical test results considered significant if  $p < 0.05$ .

**Results:** Positive lymphovascular invasion in colorectal carcinoma with high TGF- $\beta$  expression was 73.52%, while low expression was 31.25%. Statistical analysis showed a significant relationship between TGF- $\beta$  expression and lymphovascular invasion ( $p = 0.011$ ). Colorectal carcinoma with positive lymph node involvement showed high TGF- $\beta$  expression of 47.05% and low expression of 6.25%. This study found a relationship between TGF- $\beta$  expression and lymph node involvement in colorectal carcinoma ( $p = 0.012$ ).

**Conclusion:** There is a significant relationship between TGF- $\beta$  expression and lymphovascular invasion and lymph node involvement in colorectal carcinoma.

**Keywords:** Carcinoma Colorectal; TGF- $\beta$  Expression; Lymphovascular Invasion; Lymph Node