

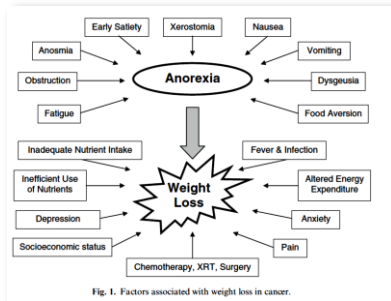
BESİN-İLAÇ ETKİLEŞİMİ

Antineoplastik İlaçlar, Beslenme Durumu ve Besin Etkileşimleri

Arş. Gör. Dr. Esmâ ASİL

Kanser hücresinin özellikler

- Ölümsüz olması- apoptoz yeteneğini kaybetmesi
- Kontrolsüz ve sınırsız çoğalma
- İmmün denetimden kaçabilme
- Kan yoluyla uzak organlara giderek çoğalma



Kanser hastalarında bozulmuş beslenme durumu:

- Daha sık acil servis müdahalesi
- Artmış komplikasyon riski
- Uzun hastanede kalma süresi
- Daha fazla tedavi gereksinimi
- Azalmış yaşam kalitesi
- Azalmış yaşam süresi ile ilişkili

Hastanın tedavi sürecinde beslenme durumu neden önemli?

- Ağırliğına göre verilen ilaçlar
- Vücut yüzey alanına göre verilen ilaçlar
- Bağışıklık sistemi- nötropeni vb?
- Komplikasyon gelişimi- tedaviye ara verme
- Kaşeksinin yanında getirdiği komplikasyonlar
- Fiziksel kapasitede azalma- Psikolojik yan etkiler...

Chemotherapy-Related Effects in Cancer

Head and Neck
 Oropharyngeal ulcerations/stomatitis
 Anosmia/dysgeusia
 Anorexia
 Learned food aversions

Esophagus
 Esophagitis

Stomach
 Nausea and vomiting

Small and large intestine
 Enteritis/colitis
 Typhilitis (*neutropenic enterocolitis*)
 Diarrhea
 Protein-losing enteropathy (*BMT recipients*)

Other
 Depression/grief
 Pain
 Anemia/fatigue

RT nin beslenme ile ilişkili komplikasyonları

Baş ve boyun bölgesi	Odinofaji
	Kserostomi
	Mukozit
	Anoreksiya
	Hipogenezi
Toraks	Disfaji
Abdomen ve pelvis	Anoreksiya
	Bulantı
	Kusma
	Diyare
	Akut enterit
	Akut kolit

Kemoterapi ilaçlarının neden olduğu yan etkiler

Sıklıkla Bulantı ve Kusmaya neden olanlar

Carmustine
Cisplatin
Cyclophosphamide
Dacarbazine
Lomustine
Mustine hydrochloride
Streptozocin

Sıklıkla mukozite neden olanlar

Bleomycin, vinblastine
Dactinomycin
Doxorubicin
Fluorouracil
İrinotecan plus fluorouracil
Melphalan
Methotrexate

Ticari ad	Jenerik ad	İlaç sınıfı	Yan etki
Elspar®	Asparginase	Antineoplastic agent	Hyperglycemia
Imuran®	Azathioprine	Immunosuppressant	Diarrhea, nausea, vomiting, altered taste acuity, sore throat
Megace®	Megesterol	Steroid (antineoplastic hormonal)	Increased appetite
Mithramycin®	Plicamycin	Antineoplastic agent	Hypocalcemia
Mutamycin®	Mitomycin	Antineoplastic agent	Nausea, ulcers
Oncovin®	Vincristine	Antineoplastic agent	Nausea ulcer
Paraplatin®	Carboplatin	Antineoplastic agent	Nausea, ulcers, hypocalcemia, hypomagnesemia
Platinol®	Cisplatin	Antineoplastic agent	Nausea, ulcers, hypocalcemia, hypomagnesemia
Velban®	Vinblastine	Antineoplastic agent	Nausea, ulcers
Ifex®	Ifosfamide	Antineoplastic agent	Nausea, ulcers

Kanser hastaları arasında besin desteği ve bitkisel ürün kullanımı oldukça yaygın

CURRENT
ONCOLOGY
A Canadian Cancer Research Journal

ORIGINAL ARTICLE

Complementary and alternative medicine use in patients before and after a cancer diagnosis

C.A. Buckner MD,^{††} R.M. Lafrenie MD,^{††} J.A. Dénommée BA,^{††} J.M. Caswell MD,* and D.A. Went MD[†]

Curr Oncol. 2018 Aug;25(4):e275-e281

Kanser hastaları arasında besin desteği ve bitkisel ürün kullanımı oldukça yaygın

CURRENT
ONCOLOGY
A Canadian Cancer Research Journal

ORIGINAL ARTICLE

Question	Choices	Response (%)
A. What were your reasons for deciding to use CAM?		
	You are just trying to do everything that can help	51.61
	Other	17.74
	Conventional treatment is too toxic	8.07
	CAM is more true to your beliefs and inner self	8.07
	You want to take control of your treatment	8.07
	Conventional treatment is too mechanistic/technological and lacks human touch	4.84
	Disappointed in efficacy of conventional medicine	1.61

Curr Oncol. 2018 Aug;25(4):e275-e281

Kanser hastaları arasında besin desteği ve bitkisel ürün kullanımı oldukça yaygın

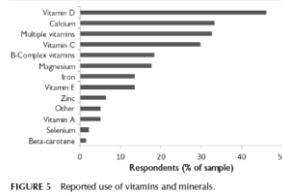


FIGURE 5 Reported use of vitamins and minerals.

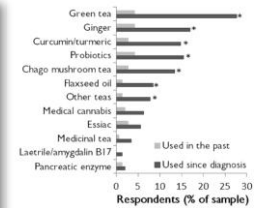


FIGURE 2 Reported frequency of biologic product use before and after cancer diagnosis. *p < 0.01.

Curr Oncol. 2018 Aug;25(4):e275-e281

Original article

Annals of Oncology 16: 655–663, 2005
doi:10.1093/annonc/mdh110
Published online 3 February 2005

Use of complementary and alternative medicine in cancer patients: a European survey

A. Molassiotis¹*, P. Fernandez-Ortega², D. Pud³, G. Ozden⁴, J. A. Scott⁵, V. Panteli⁶, A. Margulies⁷, M. Browall⁸, M. Magri⁹, S. Selvekerova¹⁰, E. Madsen¹¹, L. Milovics¹², I. Bruyns¹³, G. Gudmundsdottir¹⁴, S. Hummerston¹⁵, A. M.-A. Ahmad¹, N. Platin¹⁶, N. Kearney⁵ & E. Patiraki¹⁷

Original article

Annals of Oncology 16: 655–663, 2005
doi:10.1093/annonc/mdh110
Published online 3 February 2005

Use of complementary and alternative medicine in cancer patients: a European survey

Background: The aim of this study was to explore the use of complementary and alternative medicine (CAM) in cancer patients across a number of European countries.
Methods: A descriptive survey design was developed. Fourteen countries participated in the study and data was collected through a descriptive questionnaire from 956 patients.
Results: Data suggest that CAM is popular among cancer patients with 35.9% using some form of CAM (range among countries 14.8% to 73.1%). A heterogeneous group of 38 therapies were identified as being used. Herbal medicines and remedies were the most commonly used CAM therapies, together with homeopathy, vitamins/minerals, medicinal teas, spiritual therapies and relaxation techniques. Herbal medicine use tripled from use before diagnosis to use since diagnosis with cancer. Multivariate analysis suggested that the profile of the CAM user was that of younger people, female and with higher educational level. The source of information was mainly from friends/family and the media, while physicians and nurses played a small part in providing CAM-related information. The majority used CAM to increase the body's ability to fight cancer or improve physical and emotional well-being, and many seemed to have benefited from using CAM (even though the benefits were not necessarily related to the initial reason for using CAM). Some 4.4% of patients, however, reported side-effects, mostly transient.
Conclusions: It is imperative that health professionals explore the use of CAM with their cancer patients, educate them about potentially beneficial therapies in light of the limited available evidence of effectiveness, and work towards an integrated model of health-care provision.

Table 1. Participating countries, number of patients per country (in descending order) and frequency of CAM use

Country	n	%	CAM use [n (%)]	CAM non-use [n (%)]
Spain	115	12	34 (29.5)	81 (70.2)
Israel	111	11.6	36 (32.4)	75 (67.6)
Turkey	100	10.5	37 (37)	63 (63)
Scotland	93	9.7	27 (29)	66 (71)
Greece	81	8.5	12 (14.8)	69 (85.2)
Switzerland	72	7.5	35 (48.6)	37 (51.4)
Sweden	59	6.2	18 (30.5)	41 (69.5)
Italy	52	5.4	38 (73.1)	14 (26.9)
Czech Republic	51	5.3	30 (58.8)	21 (39.2)
Serbia	50	5.2	16 (32)	34 (68)
Denmark	50	5.2	18 (36)	32 (64)
Belgium	45	4.7	18 (40)	27 (60)
Iceland	43	4.5	13 (30.2)	30 (69.8)
England	34	3.6	10 (29.4)	24 (70.6)

CAM, complementary and alternative medicine.

Table 4. Frequency of CAM use by cancer diagnostic group (in descending order)

Diagnostic group	% of CAM use
Pancreatic cancer	56.3
Liver cancer	55.6
Benign/proliferative cancer	54.5
Breast cancer	50
Breast cancer	44.7
Stomach cancer	41.9
Gynaecological cancers	40.3
Genitourinary cancers	40
Colorectal cancer	32.7
Prostate cancer	30
Haematological cancers	26.5
Melanoma	25
Lung cancer	23.6
Head and neck cancer	22.7

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journal homepage: www.elsevier.com/locate/ctim

Reasons for complementary therapy use by cancer patients, information sources and communication with health professionals

Fatma Arıkan^{a,b}, Mürvet Artuk Uçar^b, Yasemin Kondak^b, Aysel Tekeli^b, Funda Kartöz^c, Keziban Özcan^d, Sema Sezgin Gökcu^d, Hasan Şenol Coşkun^d

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Complementary Therapies in Medicine 44 (2019) 157-161

questionnaire about complementary therapies.

Results: In this study, it was determined that 37.7% of the patients were using complementary therapies. The most commonly used complementary therapy was natural products (46.4%). The most common reason for using complementary therapy was to provide support for treatment. Almost half of the cancer patients (48.5%) did not talk about this issue with their physicians, and 41.1% of them did not talk about CT with their nurses. The study found that the most important reason why the patients did not talk about CT was that they were not asked about it by health professionals.

Sources and communication with health professionals

Fatma Arıkan^{1*}, Mürvet Artuk Uçar², Yasemin Kondak³, Aysel Tekeli³, Funda Kartöz⁴, Keziban Özcan⁵, Sema Sezgin Goksu⁵, Hasan Şenol Coşkun⁶

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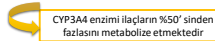
Kanser hastaları tarafından sıklıkla kullanılan bitkisel ürünler ve besin destek ürünleri

- St. John's Wort
- Sarımsak
- Ekinezya
- Ginkgobiloba
- Yeşil/siyah çay
- Zerdeçal
- Köpek balığı yüzgeci
- Üzüm çekirdeği özü
- Zencefil
- Deve dikeni sütü
- Mantar

- Kalsiyum
- Multivitamin
- Antioksidan
- C vitamini
- E Vitamini

Bitkisel Ürünler ⇔ Antineoplastik Ajanlar

- Bitkisel ürünler, özellikle enzim sistemindeki CYP3A4 ve CYP2C9 enzimlerine etki etmektedir.



Bitkisel ürünler ilaçların farmakolojik etkisini artırabilir
Yada ilaçların etkinliğini azaltabilir

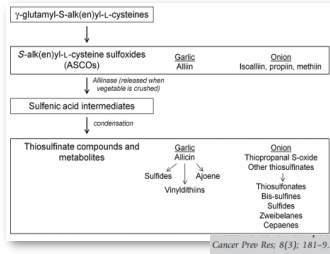
Soya fasulyesi

Meme kanseri hastalarında yaygın bir şekilde kullanılan ve selektif östrojen reseptör modülatörleri (SERM) sınıfında olan tamoksifenin de birçok bitkisel ürünle etkileşimi bulunuyor.

Genistein ⇔ tamoksifenin etkinliğini düşürür

Sarımsak & Soğan

- İçerdiği biyoaktif bileşenlerden sülfür bileşikleri sayesinde antitümörall etki gösteriyor
- Karsinogenezin her aşamasına etkisi var
- Kanser hücrelerinde apoptozisi uyarıyor



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 DOI: 10.1142/ASJC.2018.46.03.0001

The Anticancer Effects of Garlic Extracts on Bladder Cancer Compared to Cisplatin: A Common Mechanism of Action via Centromere Protein M

Won Tae Kim,^{1†} Sang-Pil Seo,² Young-Joon Ryun,³ Ho-Won Kang,⁴ Yong-Jae Kim,^{5†} Sang-Cheol Lee,^{6†} Pilho Jeong,⁷ Hye-Jin Song,⁸ Seo Young Cho,^{9,10} Jong-Joon Kim,⁶ Seon-Kyu Kim,⁷ Yun Sok Ha,¹¹ Sung-Kwon Moon,¹¹ Geun Taek Lee,¹² Isaac Yi Kim,¹² Seok Joong Yun¹³ and Won-Jae Kim¹⁴

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Abstract: Although garlic induces apoptosis in cancer cells, it is unclear whether the effects are similar to those of cisplatin against bladder cancer (BC). Therefore, this study investigated whether garlic extracts and cisplatin show similar activity when used to treat BC. The effect of garlic on T24 BC cell line was examined in a BALB/C-nude mouse xenograft model and compared with that of cisplatin. Tissue microarray analysis and gene network analysis were performed to identify differences in gene expression by control tumors and tumors exposed to garlic extract or cisplatin. Investigation of gene expression based on tissues from 165 BC patients and normal controls was then performed to identify common targets of garlic and cisplatin. Tumor volume and tumor weight in cisplatin (0.05 mg/kg)- and garlic-treated mice were significantly smaller than those in negative control mice. However, cisplatin-treated mice also showed a significant reduction in body weight. Microarray analysis of tumor tissue identified 515 common anticancer genes in the garlic and cisplatin groups ($p < 0.01$). Gene network analysis of 252 of these genes using the Cytoscape and ClueGo software packages mapped 17 genes and 9 gene ontologies to gene networks. BC (NMIBC and MIBC) patients with low expression of centromere protein M (CENPM) showed significantly better progression-free survival than those with high expression. Garlic extract shows anticancer activity in vivo similar to that of cisplatin, with no evident of side effects. Both appear to act by targeting protein-DNA complex assembly; in particular, expression of CENPM.

Cancer Epidemiology

Garlic intake and gastric cancer risk: Results from two large prospective US cohort studies

Hanseul Kim, NaNa Keum, Edward L. Giovannucci, Charles S. Fuchs, Ying Bao

First published: 23 March 2018 | <https://doi.org/10.1002/ijc.31396> | Cited by: 2

Conflict of Interest: Dr. Fuchs has potential financial conflict of interest as follows: Consultant for: Eli Lilly, Entrinsic Health, Genentech, Merck, Sanofi, Five Prime Therapeutics, Merrimack, Bayer, Agios, Taiho, Kew, Bain Capital; Board Member: CytomX.

Role of the Sponsor: The funders of our study had no role in its design or conduct; in the collection, management, analysis or interpretation of the data; or in the preparation, review or approval of the manuscript.

Cancer Epidemiology

Garlic intake and prospective US

Hanseul Kim, NaNa Keun

First published: 23 March

Conflict of Interest: Dr. Lilly, Entrinsic Health, Ger Key, Bain Capital; Board I

Role of the Sponsor: TH management, analysis or manuscript.

Abstract

Although many case-control studies suggested that garlic intake may reduce gastric cancer risk, evidence from prospective cohort studies has been lacking. We examined the association between garlic intake and subsequent risk of gastric cancer among 77,086 women in the Nurses' Health Study (1984–2014) and 46,398 men in the Health Professionals Follow-Up Study (1986–2014). Relative risks (RR) and 95% confidence intervals (95% CIs) were estimated using Cox proportional hazards models. We additionally examined garlic intake in relation to *Helicobacter pylori* (*H. pylori*) infection among 613 participants using logistic regression. During up to 30 years of follow-up, 292 participants were diagnosed with gastric cancer. The pooled multivariable RR of gastric cancer among participants who ate garlic, as compared to those who did not, were 1.11 (95% CI = 0.81–1.51) for the intake of garlic less than once per week, 0.98 (95% CI = 0.71–1.36) for one to four times per week and 1.39 (95% CI = 0.89–2.17) for five or more times per week (*p* for trend = 0.23). Similarly, no statistically significant association was observed cross-sectionally between garlic intake and *H. pylori* infection (comparing five or more times per week to never, pooled multivariable odds ratio = 1.66, 95% CI = 0.89–3.09; *p* for trend = 0.11). The findings from this large prospective study do not support the hypothesis that high garlic intake reduces risk of gastric cancer.

Baharat olarak kullanıldığında aktif içeriği göreceli olarak düşük olduğundan ilaçlarla herhangi bir etkileşime girmez.

Ancak bitkisel ilaç satan yerlerde satılanlar daha yüksek düzeylerde aktif yapılar içerir, buda ilaçlar ile kimyasal etkileşime girmesine yol açabilir

Kanser tedavisine yönelik yapılan çalışmalar

Doz?
Kullanım süresi?
Kaynağı?

Mantar

Biyoaktif bileşenleri ile

- Antiinflamatuar etki
- Antitumoral etki
- Antikarsinojenik etki

Temel biyoaktif bileşenleri:

- ✓ β-glucans,
- ✓ βproteoglycans,
- ✓ lectins,
- ✓ triterpenes,
- ✓ ergosterol,
- ✓ glutamine,
- ✓ arginine

Figueiredo and Régis *Nutrire* (2017) 4:28
DOI 10.1186/s41119-017-0050-1

Nutrire

REVIEW Open Access

Medicinal mushrooms in adjuvant cancer therapies: an approach to anticancer effects and presumed mechanisms of action

Léila Figueiredo^{1,2,3} and Willam César Bento Régis^{2,3,4,5,6*}

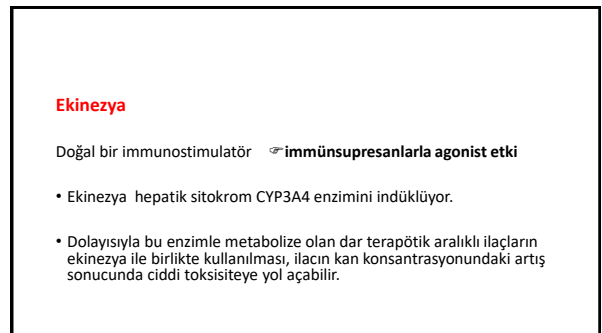
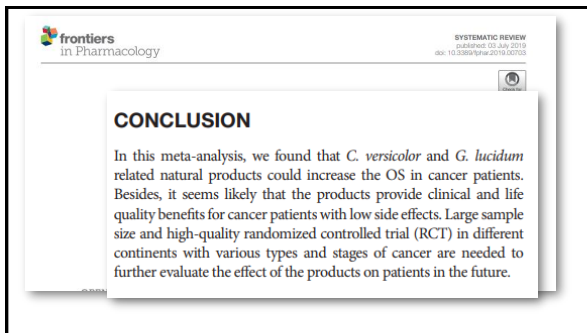
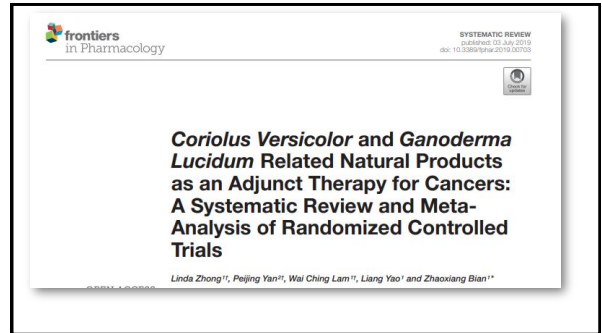
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Riquelmeo and Regis *Nutrire* (2017) 42:28
DOI 10.1186/s41110-017-0050-1

Nutrire

Table 3 Summary of human clinical studies

Mushroom	Type of study	No. of patients	Type of cancer	Extracts/compounds/ active principle	Findings	Ref.
<i>Agaricus bisporus</i>	Observational study	500 participants	Ovarian	Polyaccharides	Moderate inverse association between habitual mushroom intake and epithelial ovarian cancer	[1]
<i>Agaricus bisporus</i> / <i>Amanoderma nide</i>	Meta-analysis, observational studies	6800 women	Breast	Daily intake = 1 g/d in pre/postmenopausal women	Mushroom consumption associated to lower risk of breast cancer.	[16]
<i>Ganoderma lucidum</i>	Randomized, clinical trial	373 adults	Various types	Spore vs mycelium	Improve tumor response of lung cancer to conventional therapy. Enhance immunity. Promising adjunct treatment in immunosuppressive effects of chemotherapy. QoL relatively improved.	[41]
<i>Lentinula edodes</i>	Open pilot study	10 participants	Various types	<i>L. edodes</i> mycelia	Combine treatment of LEM and immunotherapy might improve QoL and immune function.	[22]
<i>Pleurotus cornucopae</i> Oyster	Double blind, placebo controlled study	20 participants	Various Types	Oyster extract	Potentiate immune system, may prevent cancer and other diseases.	[19]



Gingko biloba

Gingko biloba, gingko ağacının yapraklarından hazırlanır. Terpenoidler ve flavonoidler etken maddeleridir.

- ☞ Gingko biloba CYP4A3 enzim aktivasyonunu inhibe eder.
- ☞ CYP4A, CYP2C9, CYP2C19 ve CYP1A2 aktivitesine indüktif etki yapar.
- ☞ Ayrıca P-glikoproteini inhibe ederek, ilaçların etkisini azaltabilir.

St John's Wort (*Hypericum perforatum*)- Sarı Kantaron

Genel olarak CYP3A4 enzimlerini ve P-glikoprotein yolağını kullanarak metabolize olan ilaçlarla etkileşime giriyor.



- Bağırsaklarda, karaciğer ve böbrekteki P-glikoprotein ilaçların emiliminde, dağılımında veya atılmasında önemli bir rol oynamaktadır.
- P-gp'nin inhibisyonu veya induksiyonuyla, ilaçların plazma seviyeleri yükselebilir veya azalabilir.
- İlaçlar CYP ve p-gp'nin birlikte substratı olabileceği gibi ayrı ayrı da substratı olabilmektedir

St John Wort (*Hypericum perforatum*)

Antineoplastik ajanlardan irinotecan'ın aktif metabolit oranını %50'ye kadar azalttığı bulunmuştur.

Uzun süre St Wort kullanımı tümörün ilaca olan direncini de arttırabilir.

Kedi Tohumu (*Valeriana officinalis*)

Valeriana officinalis, CYP2C9 inhibisyonu, CYP2C19 induksiyonu yapar.

Tamoksifen, siklofosfamid, etoposid ve teniposid tedavisi alanlar

☞ Kedi tohumu kullanmamalıdır

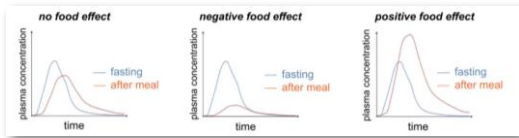
Kemoterapötik ilaçların besinlerle etkileşimi ve beslenme durumuna etkisi

İlacın adı	Potansiyel etkileşimler/Yan etkiler
Bexarotene	Greyfurt suyu ilacın etkisini artırıyor.
Carboplatin	Serum elektrolitlerin düşmesi (özellikle magnezyum ve potasyum)
Etoposide, VP-16	Greyfurt suyu ilacın emilimini azaltıyor.
Irinotecan,CPT-11	St. Wort ilaç metabolizmasını artırıcı etki gösteriyor.
Metotraksat	KC hasarı riski alkol kullanımı ile artıyor
Plicamycin	Ca ve D vitamini desteği ilacın etkisini azaltıyor

Kemoterapötik ilaçların besinlerle etkileşimi ve beslenme durumuna etkisi

İlacın adı	Potansiyel etkileşimler/Yan etkiler
Temozolomide	Besinler ilacın etkisini azaltabilir-yavaşatabilir
Busulfan, Fluorouracil, methotrexate, topotecan	Besin alımı ilacın emilim hızını düşürüyor
Erlotinib, tretionin	Besin alımı ilacın emilim hızını/derecesini artırıyor
Altretamine, capecitabine, chlorambucil, estramustine, gefitinibi melphalan, thioguanine	Besin alımı ilacın emilim derecesini düşürüyor
Procarbazine	Alkol tüketimi baş ağrısı, soluk almada güçlük, bulantı ve kusmaya neden olabilir. Tedavi süresince ve 14 gün sonrasında kadar Tyramin içeren besin tüketiminden sakınmak gerekli

Diyetin içeriği ilaçların farmakokinetiğini/farmakodinamiğini nasıl etkiliyor?



European Journal of Pharmaceutical Sciences 134 (2019) 31–59

Yüksek yağlı öğün;

☞ Yüksek yağlı besinlerin alımından sonra safra salgısı artışı ,gastrik boşalmada yavaşlama, bağırsak motilitesinde artış, lenfatik alım ve plazma yağ asitleri üretimi gibi çeşitli fizyolojik süreçler gerçekleşmektedir.

☞ Çözünürlüğü zayıf ilaçlar için safra asitleri veya lipitlerin varlığı daha iyi bir miçel çözünürlüğü sayesinde farmakolojik bileşiklerin çözünmesini kolaylaştırabilmektedir.

Örneğin yüksek yağlı bir öğün;

- Abiraterone--- ilacın metabolizmasını uzatır
- Afatinib--- ilacın Cmaks değerini azaltır.
- Cabozantinib--- ilacın Cmaks değerini arttırır.
- Lapatinip-- ilacın Cmaks değerini arttırır.

Effects of Food on the Relative Bioavailability of Lapatinib in Cancer Patients

Kevin M. Koch, Nandi J. Reddy, Roger B. Cohen, i
Andrew Stead, Andrew P. Beelen, and Lionel D. Lu

- The low-fat breakfast produced mean increases in lapatinib area under the concentration-time curve (AUC) of 167% (2.67-fold) and maximum concentration (Cmax) of 142% (2.42-fold).
- The high-fat breakfast produced mean increases in lapatinib AUC of 325% (4.25-fold) and Cmax of 203% (3.03-fold) compared with the fasted state.

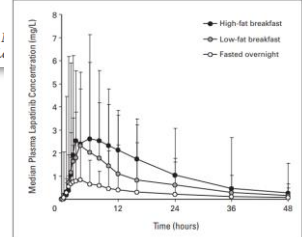


Fig 1. Median and upper ranges of plasma lapatinib concentrations versus time following a 1,500-mg dose administered after fasting overnight, after a low-fat breakfast, and after a high-fat breakfast.

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Yüksek proteinli öğün

- Yüksek proteinli besinlerin tüketimi, bazı antineoplastik ilaçların biyoyararlanımında artışa neden olabilmektedir.
- Protein açısından zengin bir besinde fosfolipidlerin varlığı ilacı daha iyi çözünür hale getirmektedir.