ELEKTRONIK SIGARA

Uzm. Dr. Eren YİĞİT

T. C. Sağlık Bakanlığı Çorlu Devlet Hastanesi

SUNUMDAN BEKLENTİLER

- Elektronik sigara nedir?
- Elektronik sigara daha çok mu özendiriyor?
- Sigara mı yoksa elektronik sigara mı?
- Elektronik sigara zararsız!
- Sigarayı bırakmak için elektronik sigara mantıklı mı?

ELEKTRONİK SİGARANIN TARİHİ

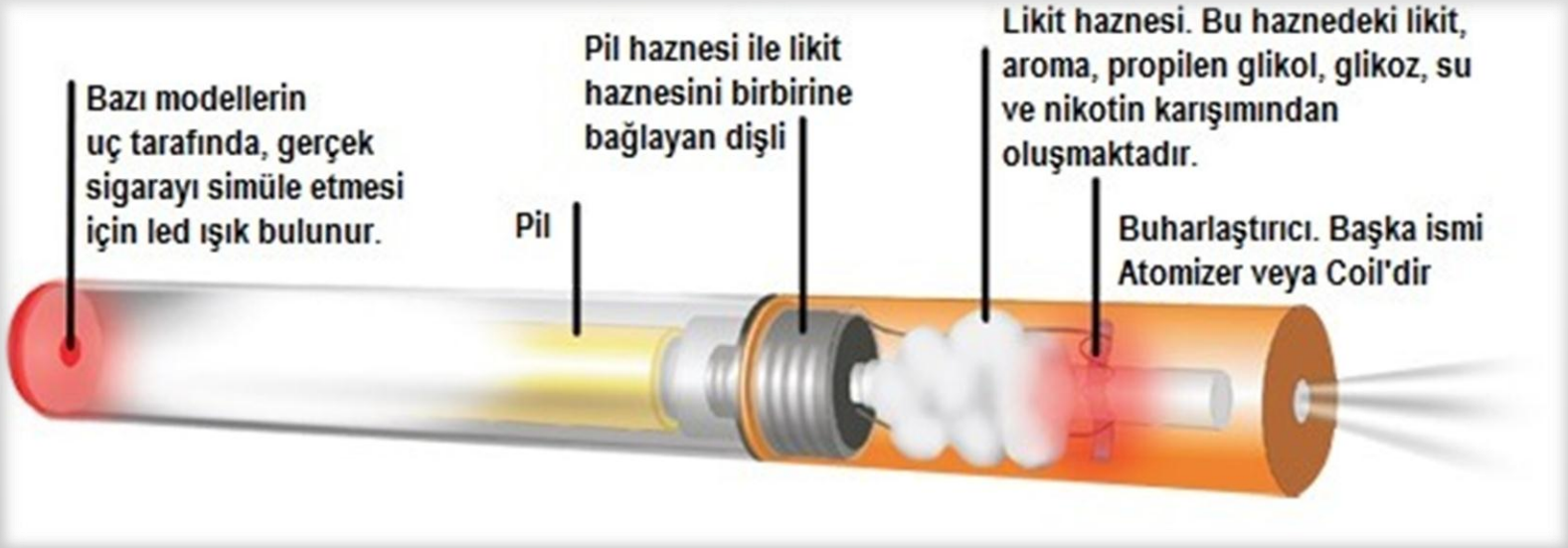
- Bilinen ilk elektronik sigara, 1963

Amerika Birleşik Devletleri'nden H. Gilbert

Elektronik sigaralar (e-sigaralar), 2003 yılında sigarayı bırakmak için Çinli bir eczacı tarafından tekrar tasarlanmış[1].

[1]Besaratinia ve Tommasi, 2014; Rahman, Hann, Wilson ve WorrallCarter, 2014

Elektronik Sigara



E-LİKİTTE NELER VAR?

- Su
- Propilen glikol
- Gliserin
- Nikotin (değişen miktarlarda)
- Aroma (tatlandırıcı)

KAÇıNCı KUŞAK?

Article

E-cigs . . . Are They Cool? Talking to Teens About E-Cigarettes

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Vania Modesto-Lowe, MD, MPH[1,2,3], and Camille Alvarado, DO, MPH[2]

Abstract
Electronic cigarettes, or e-cigarettes as they are commonly called, have gained wide acceptance among adolescents, especially those with sweet flavors such as bubble gum and cheesecake. Although health effects of e-cigarettes have not been well characterized, their use increases a teen's exposure to nicotine and may serve as a gateway to traditional cigarettes. This article outlines the basics of e-cigarettes and potential health hazards, followed by selected literature on teens' perceptions of e-cigarettes, as well as motivational interviewing strategies that can be used in talking to teens about using electronic cigarettes.

Keywords
e-cigarettes, adolescents, motivational interviewing

- Yapılan ankette e-sigara ile ilgili bilgileri akranlarından, ailelerinden, okuldaki arkadaşlarından ve TV den reklamlar aracılığıyla aldıklarını gösterdi.

- Kaliforniya-San Francisco Üniversitesi tarafından yapılan bir araştırmada, e-sigaralara kullanan ergenlerin nihayetinde geleneksel sigaraları kullanma olasılıkları daha fazla bulundu ve sigarayı bırakma olasılıkları da daha azdı.

- **Sonuç; TV e-sigara pazarlamasını sınırlamanın gençler arasında e-sigara başlatmayı azaltabileceği sonucuna varmıştır**

- e-sigara kullanmayan gençler arasında, reklamlar özendirici

- e-sigarayı daha önce tüketmemiş olan gençler reklamları izledikten sonra, e-sigaraları daha güzel, daha sağlıklı ve daha eğlenceli olarak algıladı.

Duke JC, Allen JA, Eggers ME, et al. Exploring differences in youth perceptions of the effectiveness of electronic cigarette television advertisements. Nicotine Tob Res. 2016;18:1382-1386.

* Aroma çeşitleri

*Ürün ulaşım kolaylığı

*Fiyat ve akran geçerliliği

gibi ürün özelliklerinin e-sigaraları başlangıçta ergenleri uyarıcı olmaktan daha çok çekici hale getirdiğini göstermektedir.

- En önemlisi; e-sigaraların kullanımı, gençlerin nikotin ürünlerine maruz kalmasını sebep olmakta, e-sigara kullanan ergenlerin gelecekte geleneksel sigara içmeye daha yatkın hale gelme ihtimalini arttırmaktadır.


peace

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ADDICTION MEDICINE: CLINICAL & ETHICAL PERSPECTIVES

Electronic cigarettes in physician practice

Colin P. Mendelsohn

School of Public Health and Community Medicine, University of New South Wales, Sydney, New South Wales, Australia

Key words
e-cigarettes, electronic cigarettes, harm reduction, nicotine dependence, smoking cessation.

Correspondence
Colin P. Mendelsohn, School of Public Health and Community Medicine, University of New South Wales, 11 Carlotta Road, Double Bay, Sydney, NSW 2028, Australia.
Email: c.mendelsohn@unsw.edu.au

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Abstract

There is growing evidence for the effectiveness of e-cigarettes as a quitting aid and, although not completely harmless, the scientific consensus is that they are substantially less harmful than smoking tobacco. More research is needed, but there is now sufficient empirical evidence and real-world experience over more than a decade to consider their use as a legitimate tobacco harm reduction tool for smokers who are unable or unwilling to quit with conventional strategies. Smokers should be advised that the highest success rates occur with daily use with nicotine e-liquid and newer e-cigarette models. After quitting smoking, it is preferable to aim ultimately to cease vaping if possible, but long-term use of e-cigarettes is safer than relapsing to smoking.

- Amerika Birleşik Devletleri'nde, Zhu ve ark. e-sigara kullanan sigara içenlerin sigara içmeyenlere göre en az 3 ay başarılı bir şekilde sigarayı bırakma ihtimalinin daha yüksek olduğunu bulmuş

Zhu SH, Zhuang YL, Wong S, Cummins SE, Tedeschi GJ. E-cigarette use and associated changes in population smoking cessation: evidence from US current population surveys. BMJ 2017; 358: j3262.

- İngiltere'de, Beard ve ark. e-sigara kullanımındaki artışın, bırakma girişimlerinin daha yüksek başarı oranlarıyla ilişkili olduğunu bildirmiştir.

Beard E, West R, Michie S, Brown J. Association between electronic cigarette use and changes in quit attempts, success of quit attempts, use of smoking cessation pharmacotherapy, and use of stop smoking services in England: time series analysis of population trends. BMJ 2016; 354: i4645.

- ABD’de sigara içenlerin çoğunun önümüzdeki 10 yıl içinde e-sigaraya geçmesi durumunda 6,6 milyona kadar erken yaşta sigaraya bağlı ölümlerin önlenebileceği tahmin edilmekte.
- En kötü tahminle 1,6 milyon ölüm önlenebilir.

Levy DT, Borland R, Lindblom EN, Goniewicz ML, Meza R, Holford TR et al. Potential deaths averted in USA by replacing cigarettes with e-cigarettes. Tob Control 2017; 27: 18 –25.

E-sigara buharı içindeki kansere neden olan ajanların seviyelerine bakılmış.

e-sigara içenlerde kanser riskinin, sigara içenlere göre oranının % 1'den daha az olduğu tahmin edildi

Stephens WE. Comparing the cancer potencies of emissions from vapourised nicotine products including e-cigarettes with those of tobacco smoke. Tob Control 2017; 27: 10 –17.

MALIYET


LAN?
MALBORYA
Sigara içmek cildin erken yaşlanmasına neden olur

thebmj

BMJ 2018;360:j5543 doi: 10.1136/bmj.j5543 (Published 17 January 2018)

PRACTICE

THERAPEUTICS

Electronic cigarettes for smoking cessation

Jamie Hartmann-Boyce *senior researcher*, Rachna Begh *NIHR postdoctoral research fellow*, Paul Aveyard *professor of behavioural medicine*

Nuffield Department of Primary Care Health Sciences, Radcliffe Observatory Quarter, University of Oxford, Oxford UK OX2 6GG, UK

- Fransız kohort çalışması e-sigara yardımı ile sigarayı bırakan kişilerin yarısından fazlasının, altı ay sonra artık e-sigara kullanmadığını tespit etti

[1] PasquereauA, GuignardR, AndlerR, Nguyen-ThanhV. Electronic cigarettes, quit attempts and smoking cessation: a 6-month follow-up. Addiction 2017;112:1620-8

- Sigarayı değiştirmek için bir e-sigara kullanmayı öğrenmek zaman alır.

- Nikotin
- Cihazın tipi
- Tat vericilerin dozunu değiştirerek , devam edin… Kararlı olun.

- Elektronik sigaralarınızı tatmin edici bulduktan sonra, en kısa sürede normal sigara içmeyi bırakacağınız bir gün planlayın.

- Bağımlılığın duygusal ve davranışsal yönlerine de yardımcı

RoseJE. Nicotine and nonnicotine factors in cigarette addiction. Psychopharmacology (Berl) 2006;184:274-85

- Sigarada 7.000'den fazla kimyasal toksik madde mevcut.

Peki e-sigara ?

U.S. Department of Health and Human Services, 2010

DOI: 10.1002/jcp.26352

MINI-REVIEW

WILEY Cellular Physiology

Electronic cigarette: A recent update of its toxic effects on humans

Shu-Jie Huang | Yan-Ming Xu | Andy T. Y. Lau

Laboratory of Cancer Biology and Epigenetics, Department of Cell Biology and Genetics, Shantou University Medical College, Shantou, Guangdong, People's Republic of China

Correspondence
Andy T. Y. Lau, Laboratory of Cancer Biology and Epigenetics, Department of Cell Biology and Genetics, Shantou University Medical College, 22 Xinling Road, Shantou, Guangdong 515041, People's Republic of China.
Email: andytylau@stu.edu.cn

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Electronic cigarettes (e-cigarettes), battery-powered and liquid-vaporizing devices, were invented to replace the conventional cigarette (c-cigarette) smoking for the sake of reducing the adverse effects on multiple organ systems that c-cigarettes have induced. Although some of the identified harmful components in e-cigarettes were alleged to be measured in lower quantity than those in c-cigarettes, researchers unveiled that the toxic effects of e-cigarettes should not be understated. This review is sought for an attempt to throw light on several typical types of e-cigarette components (tobacco-specific nitrosamines, carbonyl compounds, and volatile organic compounds) by revealing their possible impacts on human bodies through different action mechanisms characterized by alteration of specific biomarkers on cellular and molecular levels. In addition, this review is intended to draw the limelight that like c-cigarettes, e-cigarettes could also be accompanied with toxic effects on whole human body, which are especially apparent on respiratory system. From head to foot, from physical aspect to chemical aspect, from genotype to phenotype, potential alterations will take place upon the intake of the liquid aerosol.

KEYWORDS
biomarkers, carbonyl compounds, electronic cigarette, TSNAs, volatile organic compounds

E-cig components	Sub-group	IARC classification	Biomarker	Effect	References
TSNAs	NNK	Group 1	Thromboxane A2↑ → p-CREB↑	Promote lung cancer cell proliferation	Huang et al. (2011); Li and Tai (2009)
			Oncogenes: MYB, PIK3CA, ETS1, NRAS, SRC AKT1, KIT, and RB1↑	Promote carcinogenesis	Kalantari-Dehaghi et al. (2012)
			Tumor suppressor genes: CDKN3, FOXD3, SERPINB5, and RUNX3↓	Promote carcinogenesis	Kalantari-Dehaghi et al. (2012)
			Pyridyloxobutyl DNA adducts↑	Promote carcinogenesis	Ma et al. (2015)
			miR-206 and miR-133b↑	Promote lung carcinogenesis	Wu, Lu, Lin, Zhou, and Gu (2013); Wu et al. (2014)
			NR_026689↑	Promote lung carcinogenesis	Wu et al. (2016)
			p-ERK 1/2, cyclin D1, Bcl-2, and VEGF↑; Bax↓	Promote cell proliferation and anti-apoptotic response	McCubrey et al. (2012); Zhang et al. (2015)
			DNMT1↑ → RARβ↓	Promote cell proliferation and inhibit apoptosis	Wang et al. (2012)
	NNN	Group 1	DNA adduct py-py-dl↑	Damage DNA genome	Zarth et al. (2016)
			α3β4 nAChR acitivity↓	Weaken synaptic excitability	Nunes-Alves et al. (2013)
	NAB	Group 3	HPB, hydroxy acid, and OPB↓	Inhibit CYP2A13-catalyzed NNN metabolism	Liu et al. (2016)
	NAT	Group 3	HPB, hydroxy acid, and OPB↓	Inhibit CYP2A13-catalyzed NNN metabolism	Liu et al. (2016)
Carbonyls	Formaldehyde	Group 1	ROS level↑; SOD↓	T lymphocytes ↓→ Impairment of immune system	Lerner, Sundar, Watson, et al.,(2015); Zhang et al. (2014)
			IFN-γ, perforin, and CD122↓	Weaken cytolytic activity	Kim et al. (2013)
			AChE activity↑	Cholinergic signal reduction →Possible cognitive dysfunction	Zendehdel et al. (2016)

Acetaldehyde	Group 2B	DNA-protein crosslinks and DNA interstrand crosslinks↑	Interrupt DNA replication, repair, recombination, transcription, and chromatin remodeling	Lorenti Garcia et al. (2009); Moeller et al. (2013)
		Caspase 3/7 activity↑ → CK18↑	Hepatocyte apoptosis, NASH	Elamin et al. (2014); Feldstein et al. (2009)
		Mucin 2↑	Cell apoptosis	Elamin et al. (2014)
		CCR2, P-selectin, and TNF-α↑	Trigger immune response	Redmond et al. (2009)
Acrolein	Group 3	MuRF1↑	Mediate muscle catabolism	Rom et al. (2013)
		Protein carbonyl and TBARS↑	Cause cell apoptosis; damage liver	Shah et al. (2015)
		GSH↓	Lose part of function of detoxifying reactive aldehyde	Shah et al. (2015)
		Ang II and P450cc↑	Induce production of plasma aldosterone	Wang et al. (2016)
		Modified histone H3K4me3 and H3K9ac; FasL↑	Induce apoptosis	Ghare et al. (2016)

E-cig components	Sub-group	IARC classification	Biomarker	Effect	References
			Acrolein-DNA adducts↑	Induce lung and bladder carcinogenesis	Pan et al. (2012); Lee et al. (2014, 2015)
	Crotonaldehyde	Group 3	NADPH oxidase levels↑ → ROS production↑	Cause cell necrosis	Liu et al. (2010); Pei et al. (2014)
			TRPV1↑, Aconitase PGC-1α, and UCP-2 activity↓	Mitochondrial injury	Pei et al. (2014)
			HMPMA (crotonaldehyde metabolite)↑	Lung carcinogenesis	Park et al. (2015)
	Methylglyoxal	Group 3	Imidazopurinone, DNA crosslink, and DNA-protein crosslink↑	Endogenous DNA damage	Thornalley et al. (2010); Tu et al. (2013)
			Hyperpolarization-activated cation current↑	Potential association of diabetic polyneuropathy	Shimatani et al. (2015)
			Intracellular Ca^{2+} and classical PKCs activity↑; PI3K/Akt and β3-integrin outside signaling↓	Platelet hyperagrregation and impair thrombus stability	Hadas et al. (2013)
			ERK1/2↑; IκBα and perilipin↓	Cell apoptosis, endocrine alteration	Rodrigues et al. (2013)
			Adiponectin mRNA↓	Decreased adiponectinemia	Rodrigues et al. (2013)
			TRPA1 channels activation; Nociceptor excitation↑; Neuropeptides↑	Possible painful metabolic neuropathies	Eberhardt et al. (2012)

VOCs	Benzene	Group 1	DNA adducts↑	Genotoxicity	Meek and Klaunig (2010)
			miR-34a↑ → Bcl-2↓ → Bax and caspase-3↑	Cell apoptosis	Chen et al. (2017)
			STAT3 hypomethylation↑	Altered regulation of transcription, JAK-STAT cascade and adipocytokine signaling pathway, acute myeloid leukemia, etc	Yang et al. (2014)
	Acrylonitrile	Group 2B	Oxidative stress↑	Tumorigenesis	Pu et al. (2016); Williams et al. (2017)
			TNF-α, IL-1b, and Ccl2↑	Initiate inflammatory response	Pu et al. (2016)
			cyclin D1 and cyclin D2↑	Promote cell proliferation	Pu et al. (2016)
	Ethylbenzene	Group 2B	Urinary 8-OHdG↑	Oxidative DNA damage	Chang et al. (2011)
			Ethylbenzene-microsomal protein covalent binding	Lung tumorigenesis	Saghir et al. (2010)
	Styrene	Group 2B	Sister chromatid exchange↑; DNA damage↑	Genotoxicity	Costa et al. (2012)
	Toluene	Group 3	VDCCs blockage → ACh release↓	Alter central synaptic network and muscular contraction	Maguin et al. (2009)
			GABA receptor, neurosteroids↓	Promote hypothermia	Paez-Martinez et al. (2013)
			Dopamine↑	Neuromessage delivering	Apawu et al. (2015)
			Dopamine↓ in the nucleus accumbens on exposure to repeated toluene	Neuromessage delivering	Apawu et al. (2015)

Classification by the IARC Monographs: Group 1, carcinogenic to humans; Group 2A, probably carcinogenic to humans; Group 2B, possibly carcinogenic to humans; Group 3, not classifiable as to its carcinogenicity to humans; Group 4, probably not carcinogenic to humans.
↑, upregulation of biomarkers/increase in activity; ↓, downregulation of biomarkers/decrease in activity.

Organs	Biomarker	Effect	References
Heart and vessels	Not mentioned	Hypertension	Colombo et al. (2013)
Liver		Excessive growth of aorta	Colombo et al. (2013)
Hepatic cells	AST, ALT, ALP, and LDH↑	Hepatic injuries	El Golli et al. (2016)
Kuffer cells	C1q, C3b, C4d, and C5b-9↑	Activation of classical and alternative complement	Rubenstein et al. (2015)
	IL-2, IL-4, IL-6, and IL-13↑	Inflammatory response	Rubenstein et al. (2015)
	Xanthine oxidase↑ → hydrogen peroxide↑ Antioxidant superoxide dismutase, catalase, and glutathione-S-transferases activity↓; malondialdehyde↑	Oxidative stress	El Golli et al. (2016)
Brain	Multiple sex-dependent gene alterations	Neuropathies	Lauterstein et al. (2016)
Kidney	ROS↑	Cell apoptosis	Golli et al. (2016)
	Urea and uric acid↓	Loss of kidney function	Golli et al. (2016)

"↑" indicates upregulation of biomarkers/increase in activity; "↓" indicates downregulation of biomarkers/decrease in activity

Systematic Review and Meta-Analysis

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Efficiency and adverse events of electronic cigarettes

A systematic review and meta-analysis (PRISMA-compliant article)

Xing Liu, MD[a,b], Wan Lu, MD[c], Sheng Liao, MD[d], Zhongliang Deng, MD[b], Zhongrong Zhang, MD[d], Yun Liu, MD[e,*], Weizhong Lu, MD[a,*]

Abstract

Background: Electronic cigarettes (e-cigarettes) are a prevalent smoking cessation aid worldwide; however, a consensus regarding their efficacy and safety has yet to be reached.

Methods: We conducted a systematic review of the literature from related studies written in English or Chinese and published between January 1, 2003, and July 30, 2017. Eligible studies reporting the number of smokers who reduced or quit smoking and suffered from adverse events after e-cigarette use were selected according to predefined criteria; pertinent data were then extracted for a meta-analysis.

Results: Our search produced 198 articles; of these publications, 14 including 35,665 participants were analyzed. The pooled efficacy rate of e-cigarettes ranged from 48.3% to 58.7% for smoking reduction and from 13.2% to 22.9% for smoking cessation. The pooled rate of adverse events associated with e-cigarettes ranged from 49.1% to 51.6% based on 11 studies including 16,406 participants. The most prevalent adverse events were mouth or throat irritation, anxiety, depressed mood, nausea, and insomnia. No significant differences in overall CO_2 exhalation (eCO) levels were observed after e-cigarette use according to the data from 5 studies.

Conclusion: Our findings suggest that e-cigarettes are moderately effective with regard to smoking reduction and smoking cessation. eCO levels are unreliable for evaluating the efficacy of e-cigarettes. E-cigarette related adverse events frequently occur, especially due to high-dose nicotine-containing cartridges.

Abbreviations: E-cigarettes = electronic cigarettes, eCO = CO_2 exhalation, NRT = nicotine replacement therapy.

Keywords: adverse events, CO_2 exhalation, electronic cigarettes, smoking cessation, smoking reduction

- 1 Ocak 2003 - 30 Temmuz 2017
- İngilizce ve Çince
- 198 makale
- 35.665 katılımcı

- E-sigaraların oranı sigarayı azaltmada% 48,3 ile% 58,7
- Sigarayı bırakmada % 13,2 ile% 22,9 arasında değişmektedir
- Sigarayı azaltma, başlangıçtan 1 yıla kadar minimum % 50 azaltma

EN SıK YAN ETKILERI

- Öksürük
- Ağız içinde ve boğazda tahriş
- Anksiyete
- Depresif ruh hali
- Bulantı
- Uykusuzluk

ÖZET

- Hala yeterli bilgiye sahip değiliz
- Sigara bırakma amacı ile e-sigara kullanılmalı
- 2. kuşak  3. veya 4. kuşak (nikotin ayarlanmalı)
- Yan etkileri!
- E-sigara reklamları azaltılmalı! Önlemler alınmalı