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Sign posting the future of EBHC

Does the effectiveness of pharmaceuticals fade with time ?
- Reasons and consequences -

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Does the effectiveness of pharmaceuticals fade with time ?

BACKGROUND:

Extent of medical progress published in scientific journals

„real“ clinical medical progress

HYPOTHESIS:

The real long-term progress is NOT AS BIG as the sum of subsequently reported effects.

Does the effectiveness of pharmaceuticals fade with time ?

AIMS:

1. To investigate if the effectiveness of pharmaceuticals reported in RCTs changes with time
2. To identify the reasons

Does the effectiveness of pharmaceuticals fade with time ?

METHODS (1) - Pharmaceuticals:

Anti-glaucoma drugs:
TIMOLOL and LATANOPROST

Lipid-lowering drugs:
PRAVASTATIN and ATORVASTATIN

Standardized search in PubMed to find RCTs

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METHODS (2) – Parameters of interest:

Outcome: change of intraocular pressure (anti-glaucoma) / change of serum LDL-cholesterol (lipid-lowering)

Influence: baseline values
publication year
number of patients
assignment to experimental or control group

Statistical analysis: multiple regression by SAS ®, release 8.02

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RESULTS – PubMed Search

- Timolol: 75 (1978 – 2001)
- Latanoprost: 32 (1995 – 2001)
- Paravastatin: 64 (1990 – 2001)
- Atrovastin: 35 (1996 – 2001)

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RESULTS – Timolol (1)

Influence parameters:

- baseline pressure r = 0.695 (p < 0.0001)
- publication year r = - 0.504 (p < 0.0001)

baseline / publication year: r = - 0.396 (p = 0.0004)

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publication year → baseline → effectiveness

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RESULTS – Timolol (2)

$$y = 2.62 - 0.06 \cdot x_1 + 0.37 \cdot x_2$$

y : effectiveness (change of pressure)

x_1 : publication year

x_2: mean baseline pressure

$R^2 = 0.5453$

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Significant influence factors on effectiveness

	baseline	publ. year	
Timolol	r = 0.695	r = - 0.504	R^2 = 0.5453
Latanoprost	r = 0.874	r = - 0.464	R^2 = 0.5636
Pravastatin	r = 0.896	r = - 0.710	R^2 = 0.8477
Atrovastatin	r = 0.834	n.s.	R^2 = 0.6959

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CONCLUSIONS:

- In 3 of 4 drugs the reported effectiveness faded with time.
- In RCTs with new drugs patients were more sick, thus pretending a larger effectiveness.
- A drug achieves better results when it is new.