

Use of recommended drug therapies before percutaneous coronary intervention

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Background

- in addition to lifestyle-altering measures, drug therapy is a central recommendations of current guidelines for prevention in patients with coronary heart disease
- secondary drug prevention after hospitalization or after myocardial infarction / acute coronary syndrome:
 - Deviations in the implementation of guideline recommendations in the routine care of CHD patients in Germany
- studies in the US and Canada have shown that drug therapy before PCI is poorly implemented
- first examination of the use of drug therapy before PCI in Germany

Background

- **systematization of guideline recommendations based on routine data**
- **analysis of the implementation and the factors influencing implementation of recommended drug therapy before PCI**
- low prescription prevalence can be attributed to two main factors:
 - lack of implementation of treatment recommendations
 - high rates of treatment discontinuation / lack of adherence
- In addition to individual patient characteristics, factors of physician-patient interaction and care structure may influence the use of drug therapy

Data basis KARDIO-study



- cooperation with the University of Marburg (consortium leadership), the IHF Ludwigshafen Foundation, the University Hospital Hamburg-Eppendorf and the statutory health insurances AOK, TK and BARMER
- routine data of the participating statutory health insurance companies with a total of 42.5 million insured persons
- the aim of the project is to improve the long-term indication quality of cardiac catheterization and thus to increase the quality of care for the patients
- funded by the innovation committee of the G-BA (01VSF16048)



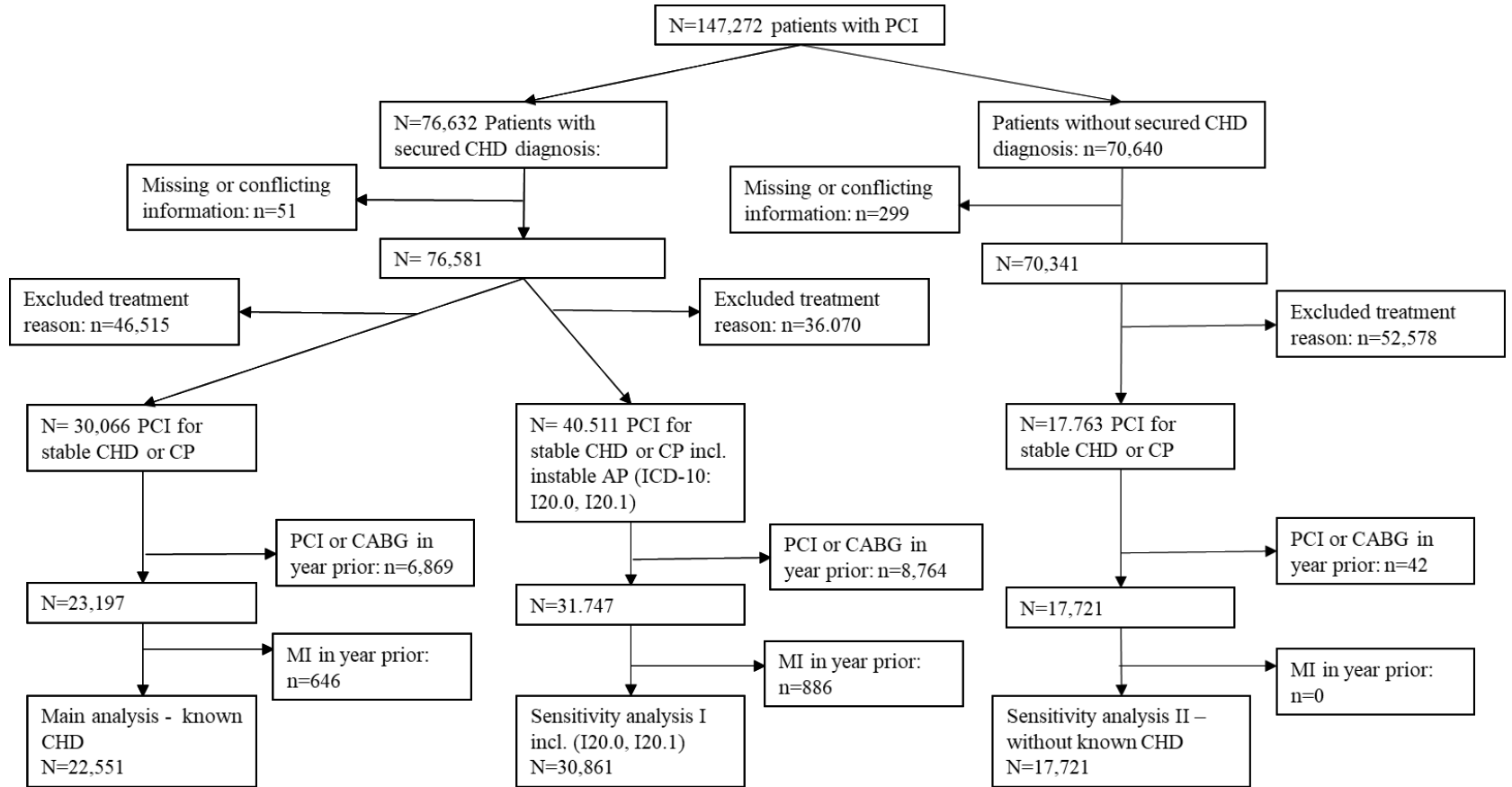
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Patient population (I)

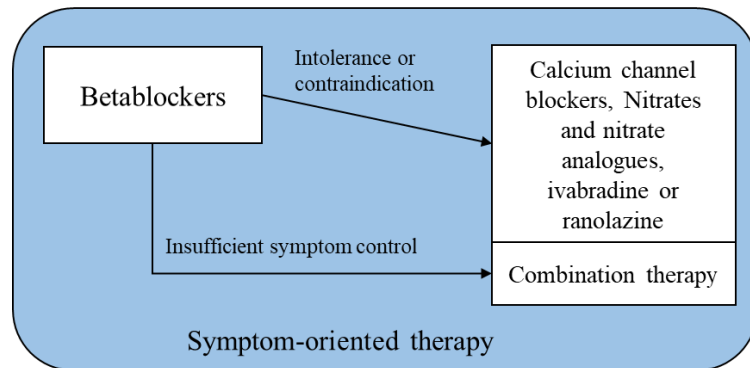
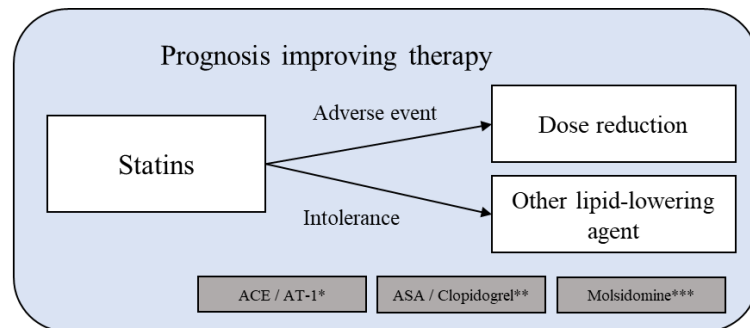
- cohort of nationwide billing data of the AOK, Barmer and Techniker Krankenkasse for the years 2014 to 2016
 - patients who underwent PCI (EBM: 34291, OPS: 8-836) in hospital or outpatient in 2016
 - 18 years and older
 - insured for at least 360 days or died after / at the time of PCI
 - patients who switched insurance between 2014 and 2016 were excluded

- main analysis: Known CHD treated for stable CHD / CP
- sensitivity analysis I: Known CHD treated for stable CHD / CP and instable AP
- sensitivity analysis II: no confirmed CHD treated for stable CHD / CP

Patient population (II)



Guideline recommendations



* only under certain conditions prognostic improving therefore not included in the combined endpoints.

** not reliably evaluable via routine data

*** only recommended subordinated to nitrates therefore not included in the combined endpoints.

ACE: Angiotensin Converting Enzyme, AT-1: Angiotensin II Receptor Subtype 1, ASA: Acetylsalicylic Acid

combined endpoints

recommended medication (RM)

patient was assigned to the user group if at least one prescription was filled within 12 months prior to PCI

- lipid lowering drugs (statins, fibrates, anion exchangers or cholesterol absorption inhibitors)

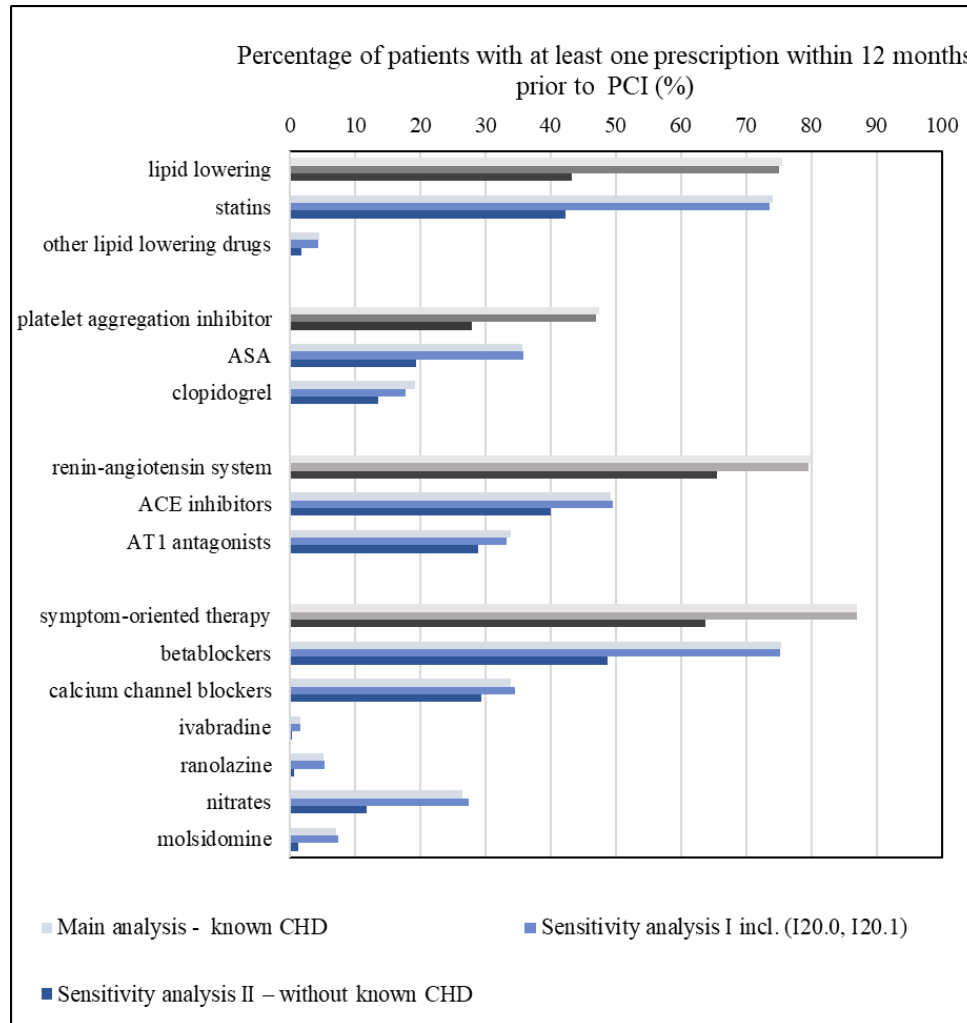
and

- symptom-oriented therapy (beta blocker, calcium channel blocker, ivabradine, ranolazine or organic nitrate)

symptom-oriented therapy:

patient was assigned to the user group if at least two drugs or a combination of the symptom-oriented therapy was prescribed within 12 months prior to PCI

Prescription prevalence



recommended therapy (at least one lipid-lowering agent and one symptom-oriented therapy)

- 68.61 % meet the criterion
- 25.40 % of patients receive one therapy
- 5.99 % patients received none

symptom-oriented therapy

- 43.56 % of patients receive two drugs
- 43.48 % of patients receive one drug
- 12.96 % of patients receive none

Multilevel model and influencing factors

| | Recommended medication (at least one lipid-lowering drug and symptom-oriented therapy) | | | Symptom-oriented therapy (at least two classes of drugs or combination) | | |
|-------------------------------|--|---------------|---------|---|---------------|---------|
| | odds ratio | 95%-CI | p-value | odds ratio | 95%-CI | p-value |
| individual level | | | | | | |
| age ^a | 0.99 | (0.98 - 0.99) | <0.001 | 1.01 | (1.01 - 1.02) | <0.001 |
| female | 1.06 | (0.99 - 1.14) | 0.084 | 1.37 | (1.29 - 1.46) | <0.001 |
| DMP CHD | 1.58 | (1.49 - 1.68) | <0.001 | 1.23 | (1.17 - 1.30) | <0.001 |
| myocardial infarction | 1.70 | (1.59 - 1.81) | <0.001 | 1.13 | (1.07 - 1.20) | <0.001 |
| previous PCI/ CABG | 1.23 | (1.10 - 1.35) | <0.001 | 1.00 | (0.92 - 1.10) | n.s. |
| cardiac insufficiency | 1.08 | (1.01 - 1.15) | 0.002 | 1.13 | (1.07 - 1.20) | <0.001 |
| hypertension | 1.66 | (1.48 - 1.86) | <0.001 | 2.80 | (2.44 - 3.21) | <0.001 |
| disorders of lipid metabolism | 2.46 | (2.29 - 2.64) | <0.001 | 1.15 | (1.07 - 1.23) | <0.001 |
| diabetes mellitus | 1.34 | (1.26 - 1.43) | <0.001 | 1.38 | (1.31 - 1.46) | <0.001 |
| PAD | 1.22 | (1.12 - 1.33) | <0.001 | 1.22 | (1.17 - 1.32) | <0.001 |
| dementia | 0.75 | (0.66 - 0.86) | <0.001 | 0.89 | (0.78 - 1.01) | n.s. |
| depression | 0.81 | (0.76 - 0.88) | <0.001 | 0.97 | (0.90 - 1.03) | n.s. |
| GP or general internist | 1.16 | (1.07 - 1.27) | <0.001 | 1.16 | (1.08 - 1.26) | <0.001 |
| cardiologist | 1.47 | (1.37 - 1.59) | <0.001 | 1.18 | (1.11 - 1.27) | <0.001 |
| a: mean centered | | | | | | |
| n.s.: not significant | | | | | | |

| | Recommended medication (at least one lipid-lowering drug and symptom-oriented therapy) | | | Symptom-oriented therapy (at least two classes of drugs or combination) | | |
|---------------------------------------|--|---------------|---------|---|---------------|---------|
| | odds ratio | 95%-CI | p-value | odds ratio | 95%-CI | p-value |
| district level | | | | | | |
| Pharmacies per 100,000 inhabitants | 1.00 | (1.00 - 1.01) | n.s. | 1.01 | (1.00 - 1.02) | n.s. |
| GPs per 100,000 inhabitants | 1.00 | (1.00 - 1.00) | n.s. | 1.00 | (1.00 - 1.00) | n.s. |
| internists per 100,000 inhabitants | 1.00 | (1.00 - 1.01) | n.s. | 1.00 | (1.00 - 1.01) | n.s. |
| Number of cases per GP | 1.00 | (1.00 - 1.00) | n.s. | 1.00 | (1.00 - 1.00) | n.s. |
| Number of cases per internist | 1.00 | (1.00 - 1.00) | n.s. | 1.00 | (1.00 - 1.00) | n.s. |
| East Germany | 1.01 | (0.91 - 1.11) | n.s. | 1.19 | (1.09 - 1.30) | <0.001 |
| constant | 0.28 | (0.18 - 0.42) | n.s. | 0.12 | (0.08 - 0.18) | <0.001 |
| Variance of districts | 0.04 | (0.02 - 0.06) | - | 0.03 | (0.02 - 0.05) | - |
| a: mean centered | | | | | | |
| n.s.: not significant | | | | | | |

Conclusion

- over 80 percent of patients receive one of the symptom-oriented therapies
- less than half receive two classes of drug
- 68 % receive a lipid-lowering agent and symptom-oriented therapy
- patients who receive the recommended drug therapy prior to PCI have a more pronounced cardiovascular history and more diagnosed comorbidities
- higher utilization and participation DMP CHD associated with higher odds
- the prescription prevalence at the regional level shows a heterogeneous picture that can not be explained solely by the individual factors of the patients
- for the symptom-oriented therapy the comparison of the East and West German districts showed a positive association with an odds ratio of 1.19 (1.09 - 1.30)

Discussion

advantages and limitations of the use of routine data

- detailed analyses of prescription profiles are possible based on medication data by linking it with claims data from other sectors and service areas
- routine data allow a nationwide, small-scale analysis of the care process
- OTC-drugs and drugs that are administered in the hospital, samples and prescriptions at the expense of private health insurance are not recorded
- a prescription is only recorded if the patient redeems the prescription
- routine data do not allow conclusions about the actual patient adherence
- special case: ASA is an OTC; Can be prescribed at the expense of the SHI (June 2013), if a CHD, backed by symptoms and complementary non-invasive or invasive diagnostics is present

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Thank you for your attention