Involvement of a supervising general practitioner in out-of-hours primary care: Effect on urgency allocation and outcome of transient ischemic attack or stroke in patients with symptoms of neurological deficit

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ABSTRACT

Background: In the out of hours primary care in the Netherlands (OHS-PC) a semi-automatic decision support tool named the Netherlands triage system (NTS) is used to generate an urgency allocation with corresponding action to be taken. When a triage nurse is in doubt, a supervising general practitioner (GP) may be consulted. The aim of this study is to evaluate the relation between involvement of the supervising GP, the urgency allocation, and the final diagnosis of TIA/stroke in patients calling the OHS-PC with neurological deficit.

Methods: Patient and triage call characteristics were retrieved form recorded telephone calls at the OHS-PC. The final diagnosis was retrieved from the electronic medical files at the general practice, including specialist letters. The relationship between involvement of a GP, urgency allocation and the diagnoses TIA and stroke was analysed with univariable and multivariable logistic regression analyses, and odds ratios (OR) were calculated, with adjusted ORs after correction for age and sex.

Results: A total of 1,343 patients were included in this study. A supervising GP was involved in 796 (59.2%) of the triage conversations. In those in whom a GP was involved, patients were significantly older (69.2 vs. 68.1 years, p = 0.009), had more frequently a medical history of TIA/stroke or cardiac arrythmia, were more often smokers, and they used more often antithrombotics. Regarding symptoms, they less often had face drooping, ataxia, dysarthria or dizziness than those in whom the GP was not involved. The urgency allocation by the NTS was more overruled if a GP was involved (34.0 vs. 17.5%, p = 0.001). The final urgency (including overruled cases) and NTS urgency allocation were similar to that in patients in whom the GP was not involved (67.7% vs. 71.0%, OR 0.89 (0.68 – 1.09)). Of all 1,343 patients, 710 (52.9%) had a TIA/stroke, most often in those in whom a supervising GP was involved (56.0 vs. 48.3%, OR 0.73 (95% CI 0.58 – 0.93)).

Conclusions: In more than half of the calls to the OHS-PC of patients with neurological deficit symptoms a supervising GP was consulted by the triage nurse, and this resulted in more overruling without a clear change in the overall level of urgency generated by the NTS, except for a tendency to reduce the number of high urgencies in males. But because the risk of TIA/stroke is higher in those in whom they are consulted, sensitivity and thus safety is reduced by this behaviour. GPs should realize that in the domain neurological deficit the population for which they are consulted by the triage nurse is older and has less neurological symptoms and thus likely more difficult to triage, but at least with a higher risk of TIA/stroke than in those in whom they are not consulted.

INTRODUCTION

Stroke is a very disabling disease with a high mortality risk. Although the global mortality rate of stroke has decreased between 1990 and 2019, the absolute number of people who have ischemic strokes annually and, the disability-adjusted life-years lost has increased. Thus, stroke is still the second-leading cause of death and the third-leading cause of disability globally. (1)

Stroke can be categorized in ischemic (87%) and haemorrhagic (13%) (2). With ischemic stroke, disruption of the blood supply to or in the brain leads to neurological symptoms. Localised nervous tissue becomes ischemic and eventually necrotic if ischemia persists for a longer period. Thus, timely diagnosis followed by a thrombolytic intervention can be vital by resolving the flow blockade and thus save brain tissue. Because a transient ischemic attack (TIA) may easily result in an ischemic stroke hours to days later if untreated, timely identification of neurological deficit symptoms is also crucial, indepent on whether symptoms are still present or have (nearly) vanished. In patients with ischemic stroke, symptoms do not resolve within minutes to hours as in TIA, but what is similar to TIA is the acute start of symptoms. With brain imaging, TIA (no evident brain tissue loss with imaging) and stroke (evident brain tissue loss with imaging) can be differentiated. Because the adagio is 'the sooner the better', it is crucial to minimize both the prehospital time and in-hospital time to intervention. The earlier the intervention is initiated, the better the outcome (3). It has been estimated that each 15 minutes less treatment delay results in around 1 month of additional disability-free life after a stroke (4).
Key in the prevention of ischemic stroke is initiation of preventive anti-platelet medication in patients with a TIA, often in combination with statins and optimal hypertension management. Then, a reduction of (recurrent) stroke of up to 80% withing 3 months may be possible (5). Another way of stroke prevention is by optimal anti-trombotic treatment of patients with atrial fibrillation with oral anticoagulants.

Recognition of neurological deficit symptoms may be difficult due to the heterogeneity of the 'clinical picture' that may be seen depending on which brain artery is blocked at which place. In addition, multiple other conditions may mimic TIA/stroke, e.g. brain tumor, epilepsy, Bell's palsy, vestibular neuritis, syncope and migraine with aura (6). Finally, symptoms of a TIA last only for minutes or hours and may be passed away at the time the patients consults the general practitioner.

In the Netherlands, patients who experience symptoms of TIA or stroke usually first call the general practitioner. In the evening, nights and weekends the primary health care is delivered by out-of-hours services in primary care (OHS-PC). When patients call the OHS-PC, triage is done by trained nurses supervised by a general practitioner (GP). During triage, a semi-automatic decision support tool is used for the assessment of the severity of the patients' symptoms and assign a level of urgency. In the Netherlands, for this purpose the 'Netherlands Triage Standard' (NTS) is used to help triage nurses. After the ABCDE check, the triage nurse has to select one of the 56 'main complaints' (e.g. neurological deficit) within the NTS system. In each 'main complaint' a standard list of questions will be generated. These questions are ordered hierarchically, starting with the most critical ones first. Subsequently, based on the patient's answers, the NTS will generate an urgency level which can vary between sending an ambulance (U1) and giving a telephone advice (U5). In *table A,* the different levels of urgency are shown. Based on other issues like the context, risk factors or alarm signals the triage nurse may upgrade or downgrade the automatically allocated urgency of the NTS. When the triage nurse is in doubt, the supervising GP may be contacted by her to come to a more well-considered decision (7).

Table A: NTS urgency levels (7)

Code	Title	Descpription	Respons time	Urgency level
U0	Resuscitation	Failure of vital functions	Immediate	High
U1	Life threatening	Unstable vital functions	As fast as possible	High
U2	Emergent	Threatened vital functions	In one hour	High
U3	Urgent	Risk of health damage	Within a few hours	Low
U4	Not urgent	Negligible chance of health damage	Within 24 hours	Low
U5	Telephone advice	No chance of health damage	Next working day	Low

Because of the large negative consequences of a TIA or stroke, it is important that the diagnosis is not missed or delayed. On the other hand, however, GPs complained in questionnaire that in general at the OHS-PC a high urgency is allocated too easily since the introduction of the NTS system in 2011. They argue that such a defensive strategy leads to an increase in workload of both the GPs and triagists at the OHS-PC (8). It would be beneficial for all parties if the diagnostic value of the NTS would be improved, both the sensitivity (safety) as the specificity (efficiency). This should result in less missed diagnoses and fewer unnecessary referrals to the hospital. Studies using the clinical outcomes for evaluation of the triage is scarce (9), and the NTS has never been validated against the final clinical outcome of patients contacting the OHS-PC (10).

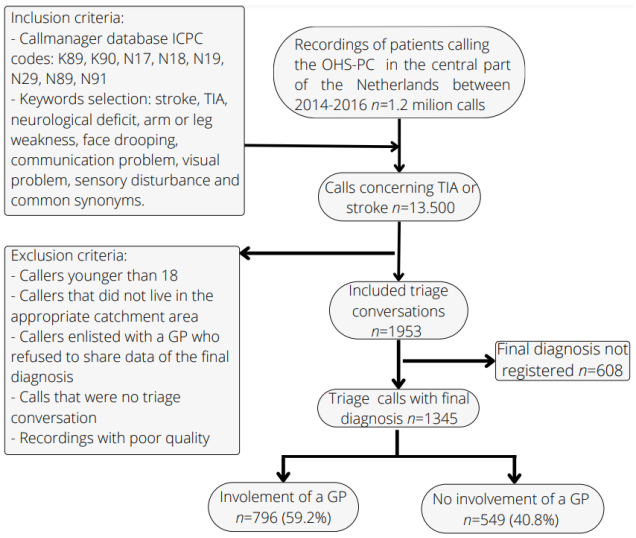
A previous study from our group showed that the sensitivity and specificity of the NTS urgency allocation for TIA, stroke or other neurological life-threatening events was 0.72 and 0.48 respectively. (11) These poor to moderate results of the NTS improved slightly after considering overruling by a triage nurse; especially the sensitivity (safety) improved. (11). Whether the sensitivity and specificity will increase even more after consultation of a supervising GP has never been studied before. The aim of this study is to investigate the relation between the involvement of a supervising general practitioner in the triage and (i) the urgency allocation and (ii) the outcome of TIA or stroke in those who call the OHS-PC for neurological deficit symptoms.

METHODS

This study is part of the Safety first which is an observational cohort study among patients who called one of the nine OHS-PC locations in the central part of the Netherlands with symptoms suggestive for acute coronary syndrome, or TIA/stroke. The aim of Safety first is to optimize the telephone triage in the Netherlands. A total of 1.2 million telephone triage conversations were recorded between 2014 and 2016. Several researchers listened to the telephone conversations and collected data about symptoms, patient and conversation characteristics, and urgency allocation. Additionally, information from the notes by the triage nurse and supervising GPs was collected. The follow up data and final diagnosis were retrieved at the callers' own GP, including the hospital discharge letters of the specialist or OHS-PC.

In this retrospective study we will evaluate the involvement of a supervising GP against the level of urgency and diagnosis of TIA/stroke. To identify the calls concerning TIA or stroke, the International Classification of Primary Care Codes (ICPC codes: i.e. K89, K90, N17, N18, N19, N29, N89, N91) was used and the following keywords in the electronic health record: neurological deficit, arm or leg weakness, face drooping, communication problem, visual problem, sensory disturbance and common synonyms. Conversations were excluded if (i) callers where younger than 18 years, (ii) did not live in the appropriate catchment area of one of the nine included OHS-PC, (iii) the patient's GP refused to share data on the final outcome, (iv) calls that were not a triage conversation and (v) recordings with poor quality. A total of 1,953 conversations were eligible to be included for this study. In 608 cases, follow up information on the final diagnosis was not provided by the GP and these cases were excluded from the analyses. Among the remaining 1,343 patients, a supervising GP was involved in 796 (59.2%) telephone triage calls. See the flow chart in Figure 1.

Figure 1 Flowchart of study population



Data analyses

For analyses we dichotomized patients into those in whom the supervising GP was involved and those without such involvement. Patient characteristics between these two groups were compared with the chi-square test for dichotomous variables and the independent-samples T-test for continuous variables. Mean and standard deviation (SD) or median and Interquartile range were calculated for all the continues, if applicable.

The urgency levels were also dichotomized; in high urgency (U1 and U2) and low urgency (U3, U4 and U5). Univariate logistic regression was used to assess the relationship between involvement of a supervising GP and (i) the allocated urgency level and (ii) final diagnosis TIA or stroke. Results of the regression analyses were expressed in odds ratios (OR) with a 95% confidence interval (95% CI). Multivariate regression was used to calculate adjusted ORs with correction for age and sex category. The same analyses were done for males and females separately. Data analyses were performed with SPSS (Statistical Package for the Social Sciences), version 26.0.01

RESULTS

Of the 1,343 patient suspected of TIA/strok,e the mean (SD) age was 68.8 (18.4) years, 43.6% were male, and in 59.2% a supervising GP was involved in the telephone triage. Patients in whom the GP was involved were older (69.2 vs. 68.1 years, p = 0.009), and their phone calls lasted longer (8:41 vs. 6:37 min., p < 0.001) than in those in whom the GP was not involved. In addition, they more often had a history of TIA/stroke (57.7 vs. 48.0%, p = 0.014), or cardiac arrhythmias (23.6 vs. 12.4%, p = 0.014), used antithrombotic medication more often (50.7 vs. 39.6%, p = 0.001), smoked more often (84.6 vs. 44.4%, p = 0.44), recognized his/her symptoms from a prior TIA/stroke (33.1 vs 17.5% p = 0.001), and had more often symptoms lasting less than 4.5 hours (62.8 vs. 54.4 %, p = 0.008) than the group without GP involvement in the call. But they had less often face drooping (44.6 vs. 55.1, p = 0.004), ataxia (79.7 vs. 89.2%, p = 0.051), dysarthria (56.8 vs. 67.9% p = 0.022 or dizziness (77.8 vs 91.7% p = 0.001) than those in whom the GP was not involved. See also *Table 1.*

Table 1. Baseline characteristics of 1953 patients who called the OHS-PC for neurological deficit between 2014 and 2016, subdivided into patients with and without involvement of a GP

Characteristics		***Total***	***Involvement of a GP***	***No involvement of a GP***	***P-value***
		No. (%) n = 1,343	*No. (%)* n = 794 (59.2)	*No. (%)* n = 549 (40.8)	
Caller characteristics	Mean age (SD) (n=1,343)	68.8 (18.4)	69.2 (17.7)	68.1 (19.3)	0.009
	Male sex (n =1,343)	585 (43.6)	348 (43.8)	237 (43.2)	0.811
Call characteristics	Mean call duration in min:sec (SD) (n=1,343)	7:44 (3:43)	8:35 (3:53)	6:31 (3:06)	< 0.001
	Conversation with someone on behalf of patient (n=1,343)	1,023 (76.2)	602 (75.8)	421 (76.7)	0.714
Medical history	TIA/stroke (n=680)	368 (54.1)	246 (57.7)	122 (48.0)	0.014
	Cardiovascular disease (n=930)	713 (76.7)	447 (77.6)	266 (75.1)	0.389
	Coronary artery disease (n=327)	56 (17.1)	35 (17.8)	21 (16.0)	0.667
	Hypertension (n=455)	223 (49.0)	140 (49.8)	83 (47.7)	0.660
	Diabetes (n=444)	156 (35.1)	99 (35.7)	57 (34.1)	0.731
	Hypercholesterolemia (n=419)	173 (41.3)	119 (44.6)	54 (35.5)	0.071
	Cardiac arrhythmia (n=316)	61 (19.3)	46 (23.6)	15 (12.4)	0.014
	Epilepsy (n=259)	29 (11.2)	17 (11.0)	12 (11.4)	0.922
	Migraine (n =103)	31 (30.1)	22 (33.8)	9 (23.7)	0.278
	Current smoking (n=22)	15 (68.2)	11 (84.6)	4 (44.4)	0.047
	Use of antithrombotic (n=995)	463 (46.5)	314 (50.7)	149 (39.6)	0.001
	Use of other CV medication (n=810)	461 (56.9)	299 (59.3)	162 (52.9)	0.075
	Family history of CVD (n=37)	26 (70.3)	18 (72.0)	8 (66.7)	0.740
Symptoms	Decreased or loss of consciousness (n= 1,343)	75 (5.6)	44 (5.5)	31 (5.6)	0.934
	Face drooping (n=761)	371 (48.8)	205 (44.6)	166 (55.1)	0.004
	Bi- or unilateral arm weakness (n=826)	354 (42.9)	230 (42.3)	124 (44.0)	0.641
	Ataxia (n=251)	209 (83.3)	126 (79.7)	83 (89.2)	0.051
	Sensory disturbances (n=396)	360 (90.9)	225 (90.0)	135 (92.7)	0.410
	Dysarthria (n=437)	266 (60.9)	158 (56.8)	108 (67.9)	0.022
	Aphasia (n=447)	249 (55.7)	152 (53.7)	97 (59.1)	0.265
	Vision problems (diplopia, blurred vision or vision loss) (n=198)	160 (80.8)	92 (82.1)	68 (79.1)	0.586
	Headache (n=517)	295 (57.1)	172 (54.4)	123 (61.2)	0.130
	Dizziness (n=325)	273 (84.0)	140 (77.8)	133 (91.7)	0.001
	Short term memory loss (n=69)	55 (79.7)	34 (82.9)	21 (75.0)	0.421
	Recognizable symptoms from prior TIA or stroke (n=383)	107 (27.9)	85 (33.1)	22 (17.5)	0.001
Course of symptoms	Acute onset of symptoms (n=231)	196 (84.8)	116 (82.9)	80 (87.9)	0.295
	Duration of symptoms <4,5h (n=1,026)	611 (59.6)	396 (62.8)	215 (54.4)	0.008
	Symptoms still present at time of calling (n= 1,343)	1217 (90.6)	719 (90.6)	498 (90.7)	0.923

Of the 1,343 patients, 826 (61.5%) had a high urgency allocated by the NTS. Participants in the group of patients in whom the GP was involved had more often a high urgency NTS (U1, U2) score (males: 57.8 vs. 66.2%, p = 0.039, females 62.6 vs.60.6%, p=0.518) and a higher final urgency score (males 66.4 vs 73.8%, p=0.055, females 68.8 vs. 68.9%, p=0.966) than patients whom a GP was not involved.

27.3% of the automatic generated NTS urgencies were overruled, more so if a GP was involved (34.0 vs. 17.5%, p < 0.001). See table 3.

Altogether, 710 (52.6%) patients were diagnosed with a TIA or stroke. In triage calls with involvement of a GP, TIA/stroke (56.0 vs 48.3%, p = 0.005) this was more frequent than in non-involved calls. Most other patients (560) had non-urgent diagnosis, and others had another life threating event (LTE); 15 patients had a brain tumour, 23 epilepsy and 37 patients other LTEs (e.g. sepsis, meningitis or hypoglycaemia).

Table 2. urgency allocation and final diagnosis of patients that called the OHS-PC for neurological deficit.

Total No. (%) n=1,343	*Involvement No. (%) n=794*	*No involvement No. (%) n=549*	*P-value*	*Involvement in females No. (%) n=446*	*No involvement in females No. (%) n=312*	*p-value*	*Involvement in males No. (%) n=348*	*No involvement in males No. (%) n=237*	*p-value*
High NTS urgency n=826 (61.5)	480 (60.5)	346 (63.0)	0.341	279 (62.6)	189 (60.6)	0.518	201 (57.8)	157 (66.2)	0.039
Overruling of the NTS by triage nurse n=366 (27.3)	270 (34.0)	96 (17.5)	0.001	164 (36.9)	53 (17.0)	0.001	106 (30.5)	43 (18.1)	0.001
Final high urgency n=927 (69.1)	537 (67.7)	390 (71.0)	0.196	306 (68.8)	215 (68.9)	0.966	231 (66.4)	175 (73.8)	0.055
Final diagnosis TIA/stroke n=710 (52.6)	445 (56.0)	265 (48.3)	0.005	245 (54.9)	149 (47.8)	0.052	200 (57.4)	116 (48.9)	0.042
Brain_tumor n=15 (1.2)	10 (1.3)	5 (1.0)	0.560	-	-	-	-	-	-
Epilepsy n=23 (1.8)	10 (1.3)	13 (2.5)	0.119	-	-	-	-	-	-
Other LTE n=37 (6.5)	16 (5.0)	21 (8.3)	0.112	-	-	-	-	-	-
Non-urgent diagnoses n=560 (41.6)	314 (39.5)	245 (44.6)	0.069	-	-	-	-	-	-

Involvement of the supervising GP and the final urgency allocation

In 69.1% of all patients a high final urgency was allocated. There was no difference between the group of patients in whom the GP was involved compared to patients with no involvement of a GP (67.7 vs 71.0%, OR 0.89 (95% CI 0.66 – 1.06). However, a high final urgency allocation was given more frequently to male patients when there was no involvement of a supervising GP after adjustment for age (66.4 vs. 73.8%, OR 0.67 (0.47 – 0.97)).

Table 3: Crude and adjusted ORs of involvement of a GP in relation to a final high-urgency allocation in patients with neurological deficit symptoms

Logistic regression	High urgency	OR (95% CI)	P-value
Crude	927 / 1,342	0.89 (0.68 – 1.09)	0.196
Adjusted for age	927 / 1,342	0.89 (0.66 – 1.06)	0.146
Adjusted for age and male sex	927 / 1,342	0.89 (0.66 – 1.06)	0.145
Crude in females	445 / 757	0.99 (0.72 – 1.35)	0.966
Adjusted for age in females	445 / 757	0.99 (0.72 – 1.35)	0.942
Crude in males	406 / 585	0.70 (0.49 – 1.01)	0.055
Adjusted for age in males	406 / 585	0.67 (0.47 – 0.97)	0.035

Involvement of the supervising GP and the final diagnoses TIA/stroke or other neurological LTE

Of all 1,343 patients, 710 (52.9%) received the diagnosis TIA or stroke. Patients got this diagnosis more often if a supervising GP was involved (56.0 vs 48.3%, crude OR 1.37 (95% CI 1.10 – 1.69)); males (57.4 vs. 48.9%, crude OR 1.41 (95% CI 1.01 – 1.96), females (54.9 vs. 47.8%, crude OR 1.33 (95% CI 1.00 – 1.79). See table 4a. After correction for age, for all patients adjusted OR 1.37 (1.08 – 1.72); for males 1.33 (0.93 – 1.89), for females 1.43 (1.03 – 1.96).

Met opmerkingen [FR2]: De relatie is positief (net als in tabel 4a) en dus groter dan 1!

In total 784 patients had a TIA/stroke or other neurological LTE. Patients got this diagnosis more often if a supervising GP was involved (60.4 vs 55.4%, crude OR 1.25 (95% CI (1.01 – 1.56)); males (crude OR 1.28 (95%CI 0.92 – 1.79), females (crude OR 1.22 (95% CI 0.99 – 1.63). See table 4b. After correction for age, for all patients adjusted OR 1.22 (95%CI 1.00 – 1.56); for males 1.18 (95%CI 0.83 – 1.69), for females 1.27 (95%CI 0.91 – 1.75).

Met opmerkingen [FR3]: De relatie is positief (net als in tabel 4a) en dus groter dan 1!

Table 4a: Crude and adjusted ORs of involvement of a GP and the relation with the final diagnosis of TIA/stroke in patients with neurological deficit

Logistic regression	Final diagnosis TIA or stroke	OR (95% CI)	P-value
Crude	710 / 1,343	1.37 (1.10 – 1.69)	0.005
Adjusted for age	710 / 1,343	1.37 (1.08 – 1.72)	0.010
Adjusted for age and male sex	710 / 1,343	1.37 (1.08 – 1.72)	0.010
Crude in females	394 / 758	1.33 (1.00 – 1.79)	0.052
Adjusted for age in females	394 / 758	1.43 (1.03 – 1.96)	0.033
Crude in males	316 / 585	1.41 (1.01 – 1.96)	0.043
Adjusted for age in males	316 / 585	1.33 (0.93 – 1.89)	0.113

Table 4b: Crude and adjusted ORs of involvement of a GP and a final diagnosis of TIA/stroke or other LTE in patients with neurological deficit

Logistic regression	Final diagnosis TIA or stroke	OR (95% CI)	P-value
Crude	784 / 1,343	1.25 (1.01 – 1.56)	0.049
Adjusted for age	784 / 1,343	1.22 (1.00 – 1.56)	0.103
Adjusted for age and male sex	784 / 1,343	1.22 (1.00 – 1.56)	0.103
C*rude* in females	437 / 758	1.22 (0.99 – 1.63)	0.185
Adjusted f*or age* in females	437 / 758	1.27 (0.91 – 1.75)	0.160
C*rude* in males	347 / 585	1.28 (0.92 – 1.79)	0.142
Adjusted f*or age* in males	347 / 585	1.18 (0.83 – 1.69)	0.359

DISCUSSION

In this study among 1,345 patients that called the OHS-PC with neurological deficit, the triage nurse consulted a GP in 59.8% of the calls, and in total 52.6% had a TIA/stroke and 6.5% another neurological LTE. Overruling resulted in higher urgency allocations in all patients, males and females, independent on whether a GP was involved. There was a tendency to less high urgency allocation if a GP was involved, driven by lower urgency allocation in males (57.8% vs. 66.2%, p=0.04). Cases in which a GP was involved more often showed to have a TIA/stroke, both in males and females than in cases in which a GP was not involved.

Patients in whom the GP was consulted group were older and had more risk factors for TIA/stroke, whereas patients in whom the GP was not consulted had more neurological deficit symptoms.
A possible explanation for this finding could be that in cases with more neurological deficit symptoms the triage nurse is more capable to finalize the urgency allocation independently of the supervising GP.

In line with the findings in literature, females had a higher risk of stroke occurring at older age than males (13).

In patients, both males and females in whom the GP was consulted there was a tendency to less high urgency allocation, but certainly a higher risk of TIA/stroke. This suggests that by involvement of the supervising GP the triage becomes less safe, however, this can be due to the fact that the more complex patients are discussed by the triage nurse (older people with less (clear) symptoms.

No prior study evaluated the relationship between consultation of a supervising GP and (i) urgency allocation and (ii) TIA/stroke in patients with symptoms of neurological deficit in the OHS-PC. There are studies from the emergency department setting, and a Canadean study showed that a trained nurse in the emergency department (ED) who used a standardized triage system such as the Cincinnati Prehospital Stroke Scale (CPSS) could improve the sensitivity of this triage tool by adequate overruling (15). An Italian study assessed the CPSS phone triage in on-the-scene prehospital assessments, and they could present a sensitivity of 0.64. More experienced centres (more often used the CPSS), the sensitivity was 0.71, comparable with the NTS in the OHS-PC in the Netherlands in this domain (0.??), but somewhat lower than the final urgency including overruling by the triage nurse (0.??) (16). However, all these studies did not evaluate the impact of a supervising specialist.

Strengths and limitations
This is the first study to analyse the correlation between involvement of a supervising GP and (i) urgency allocations and (ii) the final diagnoses TIA/stroke. Our study has several strengths. Firstly, the triage calls were relistened by a researcher which was blinded by the final diagnosis and thereby not affected by recall or observer bias. Secondly, the data had been collected from nine different OHS-PC locations in urban as well as rural areas in the Netherlands. This makes the results generalizable for the Netherlands, but likely also for countries with a similar primary healthcare OHS-PC system. Finally, with a total of 1342 cases, a relatively large sample size was analysed.
A limitation of this study is that in only 68.9% of all patients who called the OHS-PC the final diagnosis was retrieved from the GP, but this selection unlikely has a relation with urgency allocation or diagnosis TIA/stroke, and therefore unlikely resulted in selection bias. Another limitation, which is common in observational studies, is missing values.

Clinical implications

Older patients with less neurological deficit symptoms and thus more difficult cases are discussed with the supervising GP which tends to result in lower urgency allocation, at least in males. But GPs should realize that in this population for which they are consulted in this domain the risk of a TIA/stroke is more than 30% higher and that downgrading uf urgency thus results in lower safety. Given the rather poor to at the best moderate sensitivity of around 0.70, attention for safety should be higher than for efficiency (less unnecessary hospital referrals).

CONCLUSION

In more than half of the calls to the OHS-PC of patients with neurological deficit symptoms a supervising GP was consulted by the triage nurse, and this resulted in more overruling without a clear change in the overall level of urgency generated by the NTS, except for a tendency to reduce the number of high urgencies in males. But because the risk of TIA/stroke is higher in those in whom they are consulted, sensitivity and thus safety is reduced by this behaviour. GPs should realize that in the domain neurological deficit the population for which they are consulted by the triage nurse is older and has less neurological symptoms and thus likely more difficult to triage, but at least with a higher risk of TIA/stroke than in those in whom they are not consulted.

LITERATURE

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