The glory of the age is the wisdom of grey hair: association of physician appearance with outcomes in hospitalised medical patients – an observational study

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Summary

INTRODUCTION: The physical appearance of a physician may influence patients' perceptions of that physician's quality of care. There is a lack of studies investigating whether physician appearance is indeed associated with patient satisfaction and mortality.

METHODS: This observational study included adult medical inpatients treated at a Swiss tertiary care hospital between 2013 and 2016. We investigated associations of gender and physician appearance (hair colour, wearing of glasses) with in-hospital mortality and perceived quality of care, assessed by a telephone interview 30 days after admission. Regression models were adjusted for patient age, patient gender, and the Charlson Comorbidity Index.

RESULTS: We included 18,259 inpatients treated by 494 different physicians during their hospital stay. We had full information regarding patient-perceived quality of care for 9917 patients. Overall, 860 patients (4.7%) died in the hospital and 1479 (14.9%) reported low satisfaction with their care. After multivariable adjustment, there was no difference in mortality or patient-perceived quality of care whether physicians did or did not wear glasses and whether they were male or female. The hair colour of residents was also not associated with outcomes. However, patients treated by grey-haired attending physicians, compared to those with dark or blond hair, had significantly lower in-hospital mortality (adjusted odds ratio 0.70, 95% confidence interval 0.53–0.92, p = 0.011).

CONCLUSIONS: This analysis suggests that physician gender or appearance has little influence on the quality of care provided to hospitalised medical patients. Whether the small but significant mortality benefit observed for grey-haired attending physicians is possibly confounded by age and physician experience clearly needs further investigation. Nevertheless, our analysis provides empirical evidence that having at least some grey-haired attending physicians in the medical physician team seems to be beneficial for patients, even if patients do not recognise the clear superiority of their care.

Keywords: physician, experience, outcome

Introduction

The patient-physician relationship is very important for patients' well-being and may also influence treatment outcomes [1]. As physicians, however, we are rigorously trained to offer the same excellent care whether we are treating a dishevelled, malodorous, belligerent patient, or one who looks like next month's cover model for a fashion magazine. Patients, however, may not necessarily follow this same standard with clinicians.

Physicians' physical appearance, including their gender, their hair style and colour, and whether they wear glasses, may also influence patients' perceptions of the quality of care they provide. While some studies have looked at the association between the physical attractiveness of patients and physician behaviour [2], there is little data regarding the physical appearance of physicians and their patients' treatment outcomes. Still, there is some evidence regarding the association between gender and treatment outcomes. One study, for example, found lower mortality and readmission in elderly inpatients treated by female compared to male physicians [3]. Although there was no strong scientific explanation for these associations, the authors discussed how female physicians have previously been shown to adhere more strictly to clinical practice guidelines, which could, at least partly, explain some of these effects. Other studies have found that male students have better leadership skills, which may translate into better outcomes during emergency situations such as a cardiac arrest [4, 5]. There is – to the best of our knowledge – a lack of studies investigating whether other aspects of a physician's ap-

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Author contributions
SH and PS planned the study. AH, SH, MD and PS researched the literature, analysed the data and wrote the first draft of the manuscript. All authors contributed to the manuscript and agreed on its final version.

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pearance are associated with perceived quality of care and mortality.

The aim of this study was to investigate associations of different readily distinguishable features of physician appearance with mortality and patient-perceived quality of care. It should be noted that this analysis was planned and executed rigorously, but also with some humour and a twinkle in the eye.

Materials and methods

Study design

This is a secondary analysis of a prospective, observational, single centre cohort study at a 600-bed tertiary care centre in Switzerland [6, 7]. The main purpose of the initial study was to assess quality of care and treatment outcomes among medical inpatients. We included consecutive patients seeking inpatient care on the medical ward from 1 October 2013 until 1 October 2016. As an observational quality control study, the Institutional Review Board of the Canton of Aargau approved the study and waived the need for informed consent.

Treatment of patients during the study

Patients received routine clinical care during the study period. Research staff used the hospital's electronic medical system (used for coding diagnosis-related group [DRG] codes) to record patients' socio-demographics, comorbidities and outcomes until hospital discharge (in-hospital mortality). Comorbidities recorded included chronic heart failure, chronic obstructive pulmonary disease, dementia, diabetes, hypertension, coronary artery disease and malignancy, among others. We calculated the Charlson Comorbidity Index as recommended [8].

Patients participated in a routine post-discharge interview 30 days after hospital admission. This aimed to investigate short-term treatment outcomes as well as patients' satisfaction with their care. For this survey we used internal, non-validated questionnaires which asked patients to rate the care provided during their index hospital stay on a scale from 1 (very low satisfaction) to 10 (highest satisfaction). The survey included only patients who survived until 30 days after admission, could be reached by phone, and were willing to provide information.

Classification of the physician's physical appearance

We characterised treating physicians in the emergency department and the medical ward according to their gender and physical appearance. Specifically, we recorded hair colour (blond, dark, grey) and whether they consistently wore glasses. We did not have red-haired or bald physicians working in our department during the study period. Each physician's characteristics were assessed at the end of the study and were assumed to be constant over the whole study period. Physicians were divided into those who provided care in the emergency department and those who provided care on the hospital ward.

For the emergency department, the main treating resident and the attending physician responsible for the admission process and the initial treatment decisions were defined based on the signatures on the admission documents. For the medical ward, which had more frequent changes in the

team of treating physicians, the exposure of a patient to each of the defined physician characteristics was calculated from the proportion of doctor visits from different physicians during the hospital stay, as recorded in the medical charts. When documentation on the ward rounds was missing, the last visiting physician was assigned as the responsible physician.

Outcomes

In-hospital mortality was the primary endpoint of interest and this was verified through our medical records system. The main secondary endpoint of interest was patient-perceived quality of care, which was assessed through a routine post-discharge telephone interview done as part of the hospital's quality control programme. Patients were asked to rate the care provided during their hospital stay on a scale from 1 (very low satisfaction) to 10 (highest satisfaction). For statistical analysis, satisfaction with care was then dichotomised, with a cut-off at 8 points, with patients reporting ≥8 points considered to have experienced a high quality of care, and patients reporting <8 points considered to have experienced a low quality of care.

Statistical analysis

We investigated associations between physician gender and physical appearance and patient outcomes by means of multivariable logistic regression analysis and report odds ratios (ORs) and 95% confidence intervals (95% CIs). To account for possible confounders, we pre-specified that all regression models were adjusted for Charlson Comorbidity Index, patient age and patient gender. We used Stata 15.1 (StataCorp, College Station, Texas) for all statistical analyses. All testing was two-sided and p <0.05 was considered to indicate statistical significance.

Results

Study population

During the study time period a total of 18,259 inpatients were treated in the medical unit and included in the study. We had full information regarding patient-perceived quality of care from the post discharge interview for 9917 patients (54.3%). The mean age of patients was 66 years and 55% of patients were males. The most frequent admission diagnoses were myocardial infarction (8.7%), ischaemic stroke (6.3%), chronic heart failure (4.4%), pulmonary neoplasia (2.7%), and pneumonia (2.5%). Patients had a high burden of comorbidities, with a mean Charlson Comorbidity Index of 1.97. Baseline characteristics of the study population are presented in table 1.

The mean length of hospital stay was 6.28 days and 68% of patients stayed in the hospital for <7 days. The overall in-hospital mortality rate was 4.7% (n = 860). The mean reported satisfaction with care in the 9917 patients for whom we had information regarding patient-perceived quality of care was 8.6 (standard deviation [SD] 1.5), and 1479 patients (14.9%) reported a low quality of care, with <8 points, in the follow-up survey.

Physical appearance of physicians

The gender and physical features of the treating physicians working in the emergency department and on the medical wards are listed in table 2. There were 117/203 (58%) fe-

male residents in the emergency department and 114/197 (58%) on the medical ward, but fewer at the level of attending physician. Hair colour had a similar distribution for residents in the emergency department and the medical ward, with about one third having blond hair and two thirds having dark hair. For attending physicians, 28% had grey hair, 15% had blond hair and 57% had dark hair. Approximately one third to one half of physicians, depending on care location, consistently wore glasses, with a similar distribution among residents and attending physicians.

Association of physical appearance and treatment outcomes

Table 3 shows the results of the multivariate logistic regression analysis regarding the associations between the gender and physical appearance of residents and attending physicians and patient outcomes, adjusted for important patient factors (age, gender and Charlson Comorbidity Index). We had complete data on the endpoint in-hospital mortality for 12,229 patients, and on the endpoint perceived quality of care for 7590 patients. There was no significant association between gender, hair colour or wearing glasses and either in-hospital mortality or self-reported satisfaction with care for residents in the emergency department or on the medical ward. For attending physicians, however, grey hair was associated with a significantly lower probability of in-hospital mortality compared to dark hair, with an adjusted OR of 0.70 (95% CI 0.53–0.92, p = 0.011).

Discussion

Summary of findings

Despite stereotypes such as the "dumb blonde" stereotype, referring to blonde women being less intelligent than brunettes [9, 10], or the "four-eyes" or glasses stereotype, referring to the perception that people who wear glasses are smarter, more literate and better at maths [11, 12], our data suggests that physician appearance seems to have little influence on the quality of care and mortality rates of patients. Grey hair is, perhaps, one exception. While associated with significantly lower in-hospital mortality rates, grey-haired physicians are unjustly not perceived as providing a higher quality care. Why patients do not appropriately recognise the superior care provided by these physicians merits further study.

In this observational study, we hypothesised that the physical appearance of a physician could have an influence on patient mortality and patient-perceived quality of care. This hypothesis was based on several considerations. Firstly, physician attire has been shown to influence the level of trust patients have regarding the medical care provided [13]. This is also true for factors such as exposed body art (e.g. tattoos, piercings), which may influence the perceived competence, professionalism, level of care, approachability, trustworthiness and reliability of a physician [14, 15]. Having trust in the competence of a physician influences patient behaviour and medication adherence, which in turn improves treatment success [16, 17]. There are also strong psychological factors associated with the patient-physician relationship, which influence treatment outcomes in a similar manner to the placebo effect [18].

Table 1: Sociodemographics and outcomes of all patients in the study.

Sociodemographics (n = 18,259)	Age (years), mean (SD)	66 (17)
	Female gender, n (%)	8201 (44.9%)
Comorbidities (n = 18,259)	Charlson Comorbidity Index, mean (SD)	1.97 (2.46)
	Charlson Comorbidity Index ≥3, n (%)	4809 (26.3%)
	Chronic heart failure, n (%)	1609 (8.8%)
	Chronic obstructive pulmonary disease, n (%)	979 (5.4%)
	Coronary artery disease, n (%)	1962 (10.8%)
	Dementia, n (%)	538 (3.0%)
	Diabetes, n (%)	2491 (13.6%)
	Hypertension, n (%)	7812 (42.8%)
	Malignancy, n (%)	3135 (17.2%)
Clinical outcomes during the index hospital stay (n = 18,259)	Length of hospital stay, mean (SD)	6.28 (7.87)
	– Fewer than 7 days	67.9%
	Death in hospital (n, %)	860 (4.7%)
Clinical outcomes assessed after 30 days through telephone interview (n = 9917)	Patient-perceived quality of care*, mean (SD)	8.6 (1.5)
	– Low quality of care (<8 points)	1479 (14.9%)

SD = standard deviation * Patient-perceived quality of care during hospital stay was rated on a scale from 1 to 10, with lower numbers meaning lower satisfaction.

Table 2: Physical appearance of treating physicians at the emergency department and the medical wards.

		Residents in the emergency department	Attending physicians in the emergency department	Residents on the medical ward
Number of individuals		203	94	197
Female gender, n (%)		117 (58%)	32 (34%)	114 (58%)
Hair colour	Blond hair, n (%)	56 (28%)	14 (15%)	58 (29%)
	Dark hair, n (%)	147 (72%)	54 (57%)	139 (71%)
	Grey hair, n (%)	0	26 (28%)	0
Wearing glasses, n (%)		72 (36%)	45 (48%)	68 (35%)

Comparison with other research

Interestingly, and reassuringly for men, our analysis found no difference with regard to physician gender, despite previous research reporting better health outcomes in patients treated by female, compared to male, physicians. More specifically, Tsugawa et al. recently suggested that patients treated by female physicians had lower mortality (adjusted risk difference for 30-day mortality of −0.43%; 95% confidence interval −0.57% to −0.28%) and fewer unplanned readmissions (adjusted risk difference for 30-day readmissions −0.55%; 95% CI −0.71% to −0.39%), independent of the underlying conditions and the severity of disease [3]. Their model was adjusted for patient gender, ethnicity, comorbidities and estimated income. A systematic review focusing on ambulatory settings reported that female doctors may have a more patient-centred treatment approach and give longer consultations [19]. An older study found higher patient satisfaction but no difference in consultation time with female physicians [20]. Roter et al. found similar associations for hospital visits [21, 22].

Strengths and weaknesses

We were not able to validate this gender effect regarding either mortality or perceived quality of care. Differences in study design, country, health care system type of hospital, organisational differences regarding patient care within the hospital, or other factors may explain these differences between our findings and those of previous studies.

Other investigators found that when capacity was limited, there were lower ICU admission rates among female patients treated by female doctors in the emergency department compared to male-male combinations [23]. A Korean survey study found that women were generally less likely to trust physicians [24]. However, this may vary in different social contexts or health systems. Our study does not provide evidence that physical features, including physician gender, have an impact on the outcomes we studied.

These data should be interpreted in the context of the study design. First, this study was set in a single hospital in Switzerland, limiting its generalisability and external validity. While Switzerland is well known as one of the most beautiful countries in the world, its population does not top lists of the most beautiful people in surveys. If this study was done in countries known for their exceptionally beautiful people (and presumably physicians), say Ukraine, Venezuela or Sweden, results may have been different [25, 26]. Physicians were also categorised based on predefined features, namely hair colour and wearing glasses. Some physicians may have dyed their hair, while others use contact lenses instead of glasses, which could have biased our results. We did not collect any data on the physicians' age or experience, and grey hair may simply be a surrogate for more experience, which would give our main finding an obvious explanation. As we used a combined logistic regression model, interactions between patients and physician characteristics (e.g. gender interactions; reservations or prejudices towards different age groups) could only be accounted for to a limited degree. Also, multiple testing and thus a chance finding might explain the association of grey hair and outcome found in our analysis. There is also a potential selection/survivor bias for the quality of care data, with survivors potentially reporting higher satisfaction and 45% of patients from the total cohort not reporting follow-up quality data. Finally, our analysis is observational and by definition does not allow for causality to be determined.

Table 3: Results of multivariable regression analysis regarding the relationship between characteristics of the treating physician and in-hospital mortality and perceived quality of care.

		In-hospital mortality			Perceived quality of care		
		OR	95% CI	p-value	OR	95% CI	p-value
Residents at the emergency department	Female gender *reference: male*	0.909	0.756–1.093	0.309	0.982	0.850–1.136	0.811
	Blond hair *reference: dark hair*	1.049	0.867–1.270	0.623	0.880	0.760–1.019	0.088
	Wears glasses *reference: without glasses*	1.044	0.870–1.252	0.647	0.952	0.827–1.097	0.497
Attending physicians at the emergency department	Female gender *reference: male*	0.920	0.763–1.110	0.385	0.947	0.815–1.101	0.481
	Blond hair *reference: dark hair*	0.820	0.600–1.121	0.214	1.127	0.887–1.434	0.328
	Grey hair *reference: dark hair*	0.695	0.525–0.920	0.011	0.896	0.722–1.111	0.317
	Wears glasses *reference: without glasses*	1.035	0.845–1.267	0.742	1.017	0.861–1.200	0.845
Residents at the medical ward	Female gender *reference: male*	1.041	0.852–1.272	0.693	0.881	0.754–1.030	0.113
	Blond hair *reference: dark hair*	1.032	0.853–1.249	0.743	1.108	0.951–1.290	0.189
	Wears glasses *reference: without glasses*	1.092	0.889–1.341	0.400	0.937	0.797–1.101	0.431
Patient characteristics	Charlson Comorbidity Index *(per unit increase)*	1.224	1.194–1.255	<0.001	0.987	0.957–1.018	0.409
	Age *(per year)*	1.034	1.028–1.041	<0.001	1.006	1.002–1.010	0.002
	Female gender of patient *reference: male*	0.795	0.675–0.937	0.006	0.852	0.751–0.966	0.013

CI = confidence interval; OR = odds ratio All analyses were adjusted for important patient factors, including age, gender and Charlson Comorbidity Index.

Implications for clinical practice and for further research

This analysis suggests that physician gender or appearance has little influence on the quality of care provided to hospitalised medical patients. Whether the small but significant mortality benefit observed for grey-haired attending physicians is possibly confounded by age and physician experience clearly needs further investigation. Still, our analysis provides empirical evidence that having at least some grey-haired attending physicians in the medical physician team seems to be beneficial for patients. It remains unclear whether we should put more effort into educating patients about potential care differences based on physicians' hair colour.

Conclusion

This analysis asserts that gender and physician appearance have little influence on the perceived quality of care provided to hospitalised non-surgical patients, and that patients fail to associate grey hair with the improved quality of care (i.e. lower mortality) it represents. Further studies elucidating this finding should include various aspects of the grey-haired physician, including age, physique, years post-training, lab coat cleanliness and presence of a bow tie, among others.

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