

Poor patient-reported outcome after hip replacement, related to poor perception of perioperative information, commoner in immigrants than in non-immigrants

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Background and purpose — In preparing patients for total hip replacement surgery, providing thorough information helps to reduce anxiety, manage postoperative pain, prevent complications, and better engage patients in their rehabilitation. However, patient characteristics may have an influence on the ability to comprehend and assimilate the information given. We investigated differences in patients born in Sweden and those born outside Sweden regarding how they perceived the information given before THR, and if this was associated with different patient-reported outcomes one year after surgery.

Patients and methods — From Sahlgrenska University Hospital, we recruited 150 patients born in Sweden and 50 patients born outside Sweden who were to undergo THR. We retrieved routinely collected data from the Swedish Hip Arthroplasty Register including basic demographic variables and patient-reported outcome measures, both preoperatively and at 1-year follow-up. In a separate survey carried out 1–2 weeks after surgery, patients were asked about the information provided in connection with the operation.

Results — Patients born outside Sweden more frequently reported that they were poorly informed about possibilities to treat pain and about the operation itself. 1 year after the operation, patients born outside Sweden who, 1–2 weeks after the operation, had reported that they were poorly informed also reported having worse outcomes. Poorer results were found for the questions self-care and anxiety/depression in the EQ-5D questionnaire, pain on a visual analog scale (VAS), EQVAS, and EQ-5D index compared to those patients born in Sweden who had received at least some information of acceptable quality.

Interpretation — One quarter of the patients were not satisfied with the information provided before and after THR. These patients more commonly reported perioperative anxiety and they were more often born outside Sweden. Poorly informed patients

who had come from countries outside Sweden were more likely to report inferior outcome 1 year after the operation. ■

Preparation of patients for surgery and recovery is a complicated and multidisciplinary process that involves patient education and giving information about surgery and rehabilitation. The aims include reducing anxiety, managing postoperative pain, preventing postoperative complications, and getting the patient's full participation in the rehabilitation process after surgery. The educational processes are often credited with a variety of other benefits such as reducing the length of hospital stay and the costs of hospitalization. In Sweden, patients often gather information on the internet on surgical procedures, implants, waiting time for surgery, and attitudes to healthcare in populations in different regions (Infomedica 2004, www.skl.se 2004). Previous studies have shown that provision of preoperative information can alleviate preoperative anxiety, which may improve surgical outcomes, shorten hospital stay, and minimize any disruption of lifestyle (Bondy et al. 1999, Klopfenstein et al. 2000, Hughes 2002, Lee et al. 2003).

The importance of patient satisfaction with a medical or surgical treatment has been highlighted in the last few decades. The degree of satisfaction after THR is often good or excellent, but it may vary depending on many factors (Lochman 1983, Brokelman et al. 2003). Some studies have shown the importance of patients' expectations regarding the result of the operation and also on its effect on everyday life (Noble et al. 2006, Lübbecke et al. 2007, Husted 2012). Lübbecke et al. (2007) claimed that improved information and medical preparation before the operation may help to improve the success of revision THR surgery. Understanding of preoperative

information about a THA may be more difficult if the patient is not sufficiently familiar with the language of the country, or if the patient has a depressive disorder (Krupic et al. 2012). Mancuso et al. (1997) found that the patients were more satisfied with the outcome of arthroplasty when their preoperative expectations had been met.

We investigated the extent to which information about pain and pain relief before and after insertion of a THR and information about the surgical procedure itself varied between patients born in Sweden and patients born outside Sweden. We also investigated whether the perceived quality of this information was associated with different patient-reported outcomes 1 year postoperatively. We hypothesized that poorly informed patients or patients who had not obtained the information provided would report inferior outcomes 1 year after the operation regarding pain, patient satisfaction, and HRQoL.

Patients and methods

Patients scheduled for THR were recruited to the study from Sahlgrenska University Hospital from March 2010 to December 2012. This study used routinely collected data from the Swedish Hip Arthroplasty Register including basic demographic variables and patient-reported outcome measures and data from a study-specific questionnaire. During the preparation of this study, we planned to include 50 patients who had been born outside Sweden and 150 patients who had been born in Sweden. All of them were informed of the details of the study and of their rights as participants. This was done orally 2–4 weeks before the operation and with written information on the day before surgery. Patients who agreed to participate in the study were guaranteed confidentiality.

Sources of data

Standard-of-care data. 1–4 weeks before the operation, the patients visited our outpatient clinic in order to get prepared for surgery. They met an orthopedic surgeon, in most cases the operating surgeon, an anesthesiologist, a physiotherapist, and a nurse. At this visit patients were examined and given information about the type of anesthesia and surgery, expected outcomes, the risk of complications, and rehabilitation after surgery. They were also offered the chance to watch an educational film describing the surgical procedure. Language difficulties were routinely addressed using an interpreter. Basic demographic variables, details of the surgical procedure and implants used, details of any subsequent surgical procedure to the hip, and PROMs data were routinely registered in the Swedish Hip Arthroplasty Register. As part of a national program for measuring patient-reported outcomes that is run by the Swedish Hip Arthroplasty Register (Garellick et al. 2012), at the preoperative visit all patients were asked to complete a patient-reported outcome measures (PROMs) questionnaire as described below.

Study-specific data. Eligible patients were informed about the study and asked to participate in it at the preoperative outpatient visit. If they agreed to participate and met the inclusion criteria, they were sent questionnaires 1–2 weeks after the operation. The study questionnaire and a return envelope were sent out along with (repeated) written information about the study. The same questionnaires were sent out 1 year after the operation.

The inclusion criteria were provision of written informed consent to participate, living in the Västra Götaland region, and completion of a preoperative standard-of-care PROMs questionnaire.

We excluded patients with malignancy, patients with dementia, patients scheduled for 1-stage bilateral THRs, patients with reoperations during the study period, and patients with THR who had already participated in the study in conjunction with surgery on the contralateral hip.

Patient recruitment started in March 2010. In September 2011, 150 patients born in Sweden and 33 patients born outside Sweden (out of 512 patients) had accepted to participate. To enable inclusion of a total of 50 patients born outside Sweden, recruitment to this group was continued until December 2012. During the entire period of recruitment, from March 2010 to December 2012, there were 1,012 eligible patients. The number of patients who declined participation is not known, since all potential participants were not asked for logistical reasons. 11 patients (all born in Sweden) submitted incomplete forms or did not answer the forms at all. These patients were excluded.

Measures

A study-specific questionnaire was filled in 1–2 weeks after operation. This questionnaire contained 31 items mainly addressing demographic and social data, information about pain relief and the surgical procedure, the degree of pain and the effectiveness of the pain treatment provided, attention and awareness of the staff at the ward, and suggestions for improvement of the nursing. For the purposes of the present study, 9 of the questions were analyzed (Appendix, see Supplementary data). These were age, sex, education, civil status, country of birth, anxiety, perception of the information about the surgical procedure, and 2 questions about perception of the information about pain relief before and after the operation. Information about the type of hip disease (i.e. diagnosis) was obtained from the medical records.

The second part of the study questionnaire comprised the Depression and Anxiety Stress Scale-21 items (DASS-21) (Lovibond and Lovibond 1995) 1–2 weeks and 1 year after the operation. The DASS-21 score is a quantitative measure of distress covering measures of depression, anxiety (symptoms of psychological arousal), and stress (the more cognitive, subjective symptoms of anxiety) based on 3 self-reporting scales. Each of the 3 DASS-21 scales contains 7 items, which are divided into subscales of similar content.

The EQ-5D form including pain VAS and Charnley score was given to each patient about 1 month before the operation. 1 year after the operation, the same form—now also including satisfaction-VAS—was filled in by the patient. The questionnaire used in the routine PROMs program of the Swedish Hip Arthroplasty Register includes the EQ-5D health outcomes measure (EuroQol group 1990, Carr-Hill 1992), a hip pain visual analog scale (VAS), and a Charnley self-classifier measuring musculoskeletal comorbidity (Charnley 1979). Patients are asked to complete the questionnaire preoperatively and 1, 6, and 10 years postoperatively. The EQ-5D questionnaire also includes an EQ-VAS for general health ranging from 0 (worst imaginable health state) to 100 (best imaginable health state). The pain VAS ranges from 0 (no pain) to 100 (unbearable pain). At follow-up, a VAS for satisfaction with the outcome of the THR is used, where 0 represents complete satisfaction and 100 maximum dissatisfaction.

Statistics

For the statistical analysis, the answers about the perceived quality of the information was dichotomized in 2 steps. First, answers to the question “information about the surgical procedure” (3 alternatives: yes/no/I do not remember) were condensed into either “yes” or “no”. If the patient had answered that he/she did not remember, this answer was classified as “no”. Answers to the 2 questions on the “information about preoperative and postoperative pain treatment” (6 alternatives: very good/good/rather good/acceptable/poor/I did not receive any information) were classified into a group labeled “some information” including the answers very good, good, rather good, or acceptable or a group labelled “poor information” including the answers “poor” or “I did not receive any information”. In the second step, the answers to these 3 questions were again dichotomized into 2 groups. In the first, the patients had answered that they had received information about the surgical procedure and/or had been classified into the “some information” group for at least 1 of the 2 questions about postoperative pain treatment. This group, in whom the patient remembered that he/she had received information on at least one of the 3 items, was labeled the “some information” group. In the second group, the patients had answered that they had received no information or could not remember for all 3 questions. This group was labeled the “poor information” group. Thus, patients classified as poorly informed had not received any information about the surgical procedure and no information on preoperative and postoperative pain treatment, or could not remember if any information on any of these 3 items had been provided.

Factors with a possible influence on the risk of being classified as belonging to the “poor information” group were studied using binary logistic regression. Variables entered were age, sex, country of birth (in or outside Sweden), diagnosis (primary/secondary osteoarthritis), level of education (low, medium, high), civil status (cohabiting/living alone),

Charnley class (A or B/C), perioperative anxiety (yes, a little or yes, a lot/no) taken from the DASS 21 score, preoperative pain-VAS, EQ-VAS, and the 5 questions in the EQ-5D (no/moderate or extreme problems). The dependent variable was classified into “some” or “poor” information as described above. After calculation of odds ratio, we computed ROC (receiver operating characteristic) curves for 2 of the variables (born in or outside Sweden, anxiety or no anxiety) predicting that the patient would belong to the “poor information” group and computed the area under these curves (C-statistics). In the next step, we evaluated whether the outcome according to the PROM protocol 1 year after the operation differed between 4 subgroups, based on how patients perceived the information and based on place of birth (inside or outside Sweden). The 4 subgroups were: received some information and born in Sweden, received some information and born outside Sweden, received poor information and born in Sweden and received poor information and born outside Sweden. Patients born in Sweden and belonging to the “some information” group were used as a reference. All regression models including results at 1 year as the dependent variable were adjusted for the preoperative value of the same variable (when present).

Results were evaluated using binary logistic and multivariate linear regression models. Our primary outcomes were answers according to the 5 dimensions in the EQ-5D index. As indicated above, the answers were dichotomized into no or moderate/extreme problems and odds ratios were computed. In logistic regression, the odds ratio is calculated as the probability that a certain event will occur divided by the opposite outcome i.e. that it will not occur. The odds ratios we present correspond to the odds for reporting some problems in the 2 groups of patients born outside Sweden or the group born in Sweden who received poor information divided by the odds for patients born in Sweden who received some information. Values statistically significantly above 1 indicate that patients born abroad or those born in Sweden who received poor information had a higher probability of reporting problems and values significantly below 1, that the probability of reporting problems in these groups was decreased compared to the group of patients born in Sweden who had received at least some information.

In further analyses using multiple linear regression models, secondary outcomes in terms of results according to the 3 visual analog scales (EQ-VAS, pain, satisfaction) were studied. A reliability test was performed with 20 patients (10 patients born in Sweden and 10 patients born outside), who were sent the same questionnaire 3–4 weeks after they had returned the first.

Cohen’s kappa was used to study the repeatability of the answers. A kappa value of 1 indicates exact agreement and a value above 0.7 is regarded as showing satisfactory agreement. IBM SPSS software version 20.0 and R software version 3.0.1 statistics were used.

Table 1. Variables used in the statistical analysis and DASS 21 score for patients born in Sweden and those born elsewhere

Variable	Born in Sweden n (% or range)	Born outside Sweden n (% or range)	p-value
Sex			
Male	52 (37)	23 (46)	0.3 ^a
Female	87 (63)	27 (54)	
Median age	71 (28–96)	69 (36–90)	0.4 ^b
Diagnosis			
Primary OA	128 (92)	45 (91)	0.8 ^a
Secondary OA	11 (8)	5 (9)	
Charnley class			
A or B	80 (58)	26 (52)	0.5 ^a
C	57 (42)	24 (48)	
Civil status			
Cohabiting	71 (51)	26 (52)	1.0 ^a
Living alone	68 (49)	24 (48)	
Education (ISCED 97)			
Low	34 (24)	15 (30)	0.6 ^a
Middle	61 (44)	18 (36)	
High	44 (32)	17 (34)	
Postoperative anxiety ^c			
No	52 (37)	17 (34)	0.7 ^a
Some or pronounced	87 (63)	33 (66)	
Information ^c			
Acceptable or good	110 (79)	27 (54)	0.001 ^a
Poor or absent	29 (21)	23 (46)	
Median DASS21 score			
Preoperatively	2 (1–4)	3 (1–5)	< 0.001 ^b
1 year after the operation	2 (1–5)	4 (1–5)	< 0.001 ^b

^a Chi-squared test.
^b Mann-Whitney test.
^c Condensed from questionnaire (see text).

Ethical approval was obtained from the Regional Ethical Review Board in Gothenburg (decision 339-13).

Results

In the group born in Sweden, there were 87 women (63%) and 52 men (37%) and the median age was 71 (28–96) years. The immigrant group consisted of 27 women and 23 men with a median age of 69 (36–90) years (Table 1). 8 patients were born in one of the Nordic countries outside Sweden, 34 in other European countries outside the Nordic ones, and 8 were born in countries outside Europe. The patients included in the study stayed in hospital mean 6 (3–9) days after the operation.

52 patients reported that they had not received information or that they could not remember if they had received any information concerning the surgical procedure and pre- and post-operative pain treatment. These patients were classified in the “poor information” group. The remaining patients reported that they had received acceptable or good information on at least 1 of the questions. These patients were classified in the “some information” information group (n = 137).

Reliability of the form

Answers to the questions on country of birth, education, civil status, and information about pain relief before and after the operation and the DASS-21 score all had an exact agreement (kappa = 1.0). The questions about information on the surgical procedure and the presence of anxiety showed a small inconsistency; both had a kappa value of 0.83 (95% confidence intervals (CIs): 0.5–1.0 and 0.62–1.0, respectively).

Factors associated with the perceived quality of information

Patients born outside Sweden showed similar demographics, educational level, and social status to those patients who were born in Sweden (Table 1). According to DASS-21, patients born outside Sweden more frequently reported having anxiety during the postoperative week(s) and also 1 year after the operation. The single question about anxiety in the first part of the study questionnaire did not, however, show any statistically significant difference between patients born outside Sweden and those born in Sweden. Patients born outside Sweden more frequently belonged to the group who reported that they had been poorly informed, as reflected by a relative predominance in the “poor quality of information” group. In the logistic regression analysis, 2 of the variables—born outside/ born in Sweden (unadjusted OR = 3.6, 95% CI: 1.6–6.4; p = 0.001) and anxiety/no anxiety (unadjusted OR = 4.4, 95% CI: 1.9–10; p < 0.001) were associated with an increased risk of perceiving poor quality of information. After adjustment for confounders, each of these variables showed similar odds ratios (born outside Sweden/in Sweden: OR = 3.6, 95% CI: 1.7–7.8; p = 0.001; C-statistics: 0.62, 95% CI: 0.52–0.72; and anxiety/no anxiety after the operation: OR = 4.5, 95% CI: 1.9–11; p = 0.001; C-statistics: 0.64, 95% CI: 0.56–0.73). Addition of variables from the preoperative PROM protocol (answers on the separate EQ-5D domains, pain-VAS, EQ-VAS, and EQ-5D index) had no or only minor influence on this outcome (data not shown).

Influence on outcome at 1 year

Patients born outside Sweden in the “poor information” group showed inferior outcomes 1 year after the operation, according to several of the variables in the PROMs protocol. Evaluation of the 5 dimensions in the EQ-5D revealed more problems with self-care and anxiety/depression also after adjustment for covariates (Tables 2–4, for Tables 3 and 4, see Supplementary data). Patients in the “poor information” group who had not been born in Sweden also reported more problems with usual activities, but this difference became insignificant after adjustment for covariates. They also reported lower EQ-5D index, EQ-VAS, and pain-VAS. Before any adjustment for covariates, the results reported from patients born in Sweden were similar in those who were judged to have received “poor” information and those who had received “some” information.

Table 2. EQ-5D index, EQ-VAS, and pain VAS before and 1 year after the operation. Satisfaction VAS 1 year after the operation. Values are mean (95% confidence interval)

	Preoperatively	After 1 year
Pain VAS		
Some information		
Born elsewhere	63 (54–72)	22 (15–30)
Born in Sweden	65 (61–68)	18 (14–21)
Poor information		
Born elsewhere	60 (51–70)	29 (19–39)
Born in Sweden	67 (61–73)	17 (10–24)
Satisfaction VAS		
Some information		
Born elsewhere		36 (26–46)
Born in Sweden		26 (22–31)
Poor information		
Born elsewhere		29 (21–37)
Born in Sweden		26 (15–36)
EQVAS		
Some information		
Born elsewhere	50 (41–58)	63 (53–73)
Born in Sweden	55 (50–59)	72 (68–76)
Poor information		
Born elsewhere	58 (50–65)	56 (45–66)
Born in Sweden	57 (50–64)	77 (70–85)
EQ-5D index		
Some information		
Born elsewhere	0.67 (0.48–0.86)	0.70 (0.60–0.80)
Born in Sweden	0.42 (0.32–0.51)	0.68 (0.63–0.73)
Poor information		
Born elsewhere	0.48 (0.26–0.70)	0.55 (0.43–0.68)
Born in Sweden	0.55 (0.36–0.74)	0.75 (0.65–0.84)

After adjustment for covariants, fewer patients in the “poor information” group who were born in Sweden thought that they had problems with pain/discomfort according to the individual questions in the EQ-5D protocol. Thus, several of the outcomes after 1 year were inferior in patients in the “poor” information group, but only if the patient had been born outside Sweden.

Discussion

We explored the extent to which information about pain and pain relief before and after insertion of a THR and information about the surgical procedure itself varied between patients born in Sweden and patients born outside Sweden. We also investigated whether the perceived quality of this information was associated with different patient-reported outcomes 1 year postoperatively. We hypothesized that poorly informed patients or patients who had not retained the information provided would report inferior outcomes. We found that patients born in Sweden had retained more information than those born outside Sweden. We do not know if this difference was caused by the personnel at the hospital providing less information to this patient group. Other factors such as a poorer mental status as indicated by the DASS-21 score and insufficient experi-

ence of the Swedish language most probably had an influence. People in a state of distress may have difficulty in retaining information (Robinson et al. 2013). Patients who reported having some or more pronounced anxiety on the postoperative form were over-represented in the poorly informed group. The distribution of patients with anxiety who were born outside Sweden and in Sweden was, however, rather equal—contradicting the theory that perioperative anxiety was of decisive influence.

Slightly less than half of the patients in both groups lived with a partner or with 1 or more children, and the level of education was rather equally distributed. Patients living together with someone else and those with higher education could be expected to be able to obtain information more easily and those with higher education might have more realistic expectations and better knowledge about how to optimize the rehabilitation period, but none of these factors had a statistically significant influence on any of the outcome parameters studied at the 1-year follow-up. Despite the high educational level, some of these patients may have difficulty in finding employment—especially if born outside the country—because of language problems and other factors. The reason for this might be that educational level and socioeconomic status are not always correlated, and especially not in patients born in another country (Sjöling et al. 2003).

For patients undergoing THR, there is insufficient evidence to support the use of preoperative information above standard care to improve postoperative outcomes, especially regarding pain and functioning. There may be beneficial effects when preoperative information is tailored according to the level of anxiety, or targets those who are most in need of support (e.g. those who are particularly disabled, or have limited social support structures). There is evidence, however, that preoperative information has a modest beneficial effect on preoperative anxiety (Sjöling et al. 2003).

Quintres et al. (2002) used an education program to prepare patients before performing a THR. These authors showed that a collective multidisciplinary information session 2–6 weeks before the operation may reduce pain before surgery and prevent an increase in anxiety. The patients included in this program had a better idea of what to expect and had an interactive discussion with the team members. The same patients also felt less pain, perhaps because they were less stressed and better prepared to cope with pain. The patients were mobilized earlier, probably because of better motivation (Quintres et al. 2002, Krupic et al. 2013). Anxiety has been reported to increase sensitivity to pain and reduction of anxiety reduces complaints of pain (Reading 1979, Sjöling et al. 2003). Improved preoperative information is also an important part of so-called “fast-track” treatment, which has a proven effect on the quality total hip and knee replacement (Howell and Rogers 2009, Nilsson et al. 2009, Husted 2012). It might, however, be that some patient groups require especially tailored information.

In an interview study using qualitative content analysis, we found that the information to our patients could be substantially improved—both to patients born in Sweden and to those born outside Sweden (Krupic et al. 2012). The study design of this previous investigation did not allow a detailed quantitative analysis. The present study shows a difference in how patients born in Sweden and those born outside Sweden perceive the quality of preoperative and postoperative information. In the interview study mentioned above, patients from both groups expressed concern about inadequate preoperative information pertaining to the surgery, implant selection, pain relief, and choice of anesthesia. They often complained about having no time or too short a time to put questions to the surgeon, and described an overall stressful situation. Insufficient preoperative information may be especially harmful to immigrants, because this group tends to have more depression than those born in Sweden (Krupic et al. 2012).

In a randomized study, Jjala et al. (2010) found that watching a short educational film before the operation reduced the anxiety of patients who were to undergo elective surgery under regional anesthesia. The prevalence of “high” anxiety 2 weeks before surgery was 17% in the assessment clinic. Immediately before surgery, this increased to 27% among those who watched the film and 36% among those who did not. After operation, only 2% reported high anxiety in the film group as compared to 5% in the controls.

Stanley et al. (1998) investigated whether detailed information improved patients’ understanding, and whether it could influence the level of anxiety. All the patients were given routine information and were then randomized to receive standard information verbally, standard written information, both, or no other information at all. The patients completed questionnaires on the day of admission to hospital and after discharge, which included rating of anxiety and depression levels. The authors found that written information increased patient satisfaction, but it did not enhance understanding of the risks and complications of the procedure (Stanley et al. 1998).

Limitations of the study

We investigated the extent to which as many as 8 variables could be used to predict the outcome 1 year after THR in a limited group of patients, which might suggest too little statistical power. On the other hand, the recruitment of patients born outside Sweden took a long time and the recruitment period had to be extended. To reduce the number of variables, we divided the patients into 2 groups, 1 group where they had answered that the information was poor or absent regarding all 3 questions and the second group where they had answered that the information was at least satisfactory for at least 1 of 3 questions. By doing so, we could define 1 group of patients who definitely had received insufficient information or for various reasons did not remember the information provided. Further separation of the answers into different grades of perceived quality of the information is possible, but this would

require a larger patient material. In a future study involving more hospitals, it would also be of interest to make a more differentiated separation of patients born outside their country of residence based on regions of origin and—if possible—also cultural background.

The questionnaires used in our study were all in the Swedish language, and we do not know the extent to which the patients included were familiar with this language. The study may also have suffered from information bias, since patients born in Sweden may have been exposed to more information—and of better quality—than that given to immigrants. All patients born outside Sweden did, however, return completed forms, indicating that they understood the questions with or without the help of a relative or friend to translate or interpret the forms. We do not know the extent to which this was done in either of the groups, and the degree to which this would have influenced the results.

There might be several reasons for why as many as one quarter of the patients answered that they were poorly informed. It might be that no information was provided, that it was of such poor quality that they did not understand, or that they did not care because they were anxious or depressive—or had received narcotics for pain relief. According to the present study, lack of information or poorly perceived information appears to be especially deleterious for patients born abroad. Further studies involving evaluation of different types of intervention to improve pre- and perioperative information and possibly with modified content are necessary to definitely establish whether this could improve the outcome for this group. Poorly informed patients born in Sweden appeared to be less susceptible to a poorer outcome if the preoperative and postoperative information was regarded as insufficient.

Supplementary data

The Appendix and Tables 3 and 4 are available on the Acta Orthopaedica website at www.actaorthop.org, identification number 8870.

FK and JK contributed to the conception/design of the study. FK collected the data. Statistical evaluation was done by JK, SN, and FK. All the authors drafted the manuscript and critically revised it.

No competing interests declared.

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