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ORIGINAL ARTICLE

Menopausal hormone therapy reduces the risk of fracture regardless of falls risk or baseline FRAX probability—results from the Women's Health Initiative hormone therapy trials

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Abstract

Summary In a combined analysis of 25,389 postmenopausal women aged 50–79 years, enrolled in the two Women's Health Initiative hormone therapy trials, menopausal hormone therapy vs. placebo reduced the risk of fracture regardless of baseline FRAX fracture probability and falls history.

Introduction The aim of this study was to determine if the anti-fracture efficacy of menopausal hormone therapy (MHT) differed by baseline falls history or fracture risk probability as estimated by FRAX, in a combined analysis of the two Women's Health Initiative (WHI) hormone therapy trials.

Methods A total of 25,389 postmenopausal women aged 50–79 years were randomized to receive MHT ($n = 12{,}739$) or matching placebo ($n = 12{,}650$). At baseline, questionnaires were used to collect information on falls history, within the last 12 months, and clinical risk factors. FRAX 10-year probability of major osteoporotic fracture (MOF) was calculated without BMD. Incident clinical fractures were verified using medical records. An extension of Poisson regression was used to investigate the relationship between treatment and fractures in (1) the whole cohort; (2) those with prior falls; and (3) those without prior falls. The effect of baseline FRAX probability on efficacy was investigated in the whole cohort.

Results Over 4.3 ± 2.1 years (mean ± SD), MHT (vs. placebo) significantly reduced the risk of any clinical fracture (hazard ratio [HR] 0.72 [95% CI, 0.65–0.78]), MOF (HR 0.60 [95% CI, 0.53–0.69]), and hip fracture (0.66 [95% CI, 0.45–0.96]). Treatment was effective in reducing the risk of any clinical fracture, MOF, and hip fracture in women regardless of baseline FRAX MOF probability, with no evidence of an interaction between MHT and FRAX ($p > 0.30$). Similarly, there was no interaction ($p > 0.30$) between MHT and prior falls.

Conclusion In the combined WHI trials, compared to placebo, MHT reduces fracture risk regardless of FRAX probability and falls history in postmenopausal women.

Keywords Epidemiology · Falls · Fracture risk · FRAX · Menopausal hormone therapy · Postmenopausal women · Osteoporosis

Introduction

The two parallel Women's Health Initiative (WHI) placebo-controlled, randomized, clinical trials were designed to investigate the effect of menopausal hormone therapy (MHT) on a number of chronic diseases in healthy postmenopausal women [1]. These trials investigated either the effect of conjugated equine estrogen (CEE) alone vs. placebo, or a combination of CEE and medroxyprogesterone acetate (MPA) vs. placebo. Both these treatment regimens reduced the risk of any fracture, vertebral fracture, and hip fracture [2, 3], but conversely increased the risk of stroke and deep vein thrombosis and were at the time deemed to have no overall net health benefit, resulting in the recommendation that they are not indicated for the prevention of chronic disease in postmenopausal women [1, 2, 4, 5]. Subsequent subgroup reanalyses of WHI study data revealed that the benefit-to-risk relationship for the CEE alone trial was more favorable in younger postmenopausal women and that MHT was associated with reduced overall mortality in

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younger women, aged 50–59 years, but had no survival benefit in older women [6]. MHT is currently recommended for the treatment of menopausal symptoms in women younger than 60 years or within 10 years of menopause onset and can be considered to treat osteoporosis in osteoporotic women who do not tolerate other osteoporosis medication [5, 7, 8].

FRAX is a computer-based algorithm used to determine fracture probability in men and women, based on several easily identifiable clinical risk factors, including prior fracture, parental hip fracture, current smoking, and oral glucocorticoid use, and can be used with or without bone mineral density (BMD). It calculates the 10-year probability of major osteoporotic fracture (MOF; clinical spine, hip, forearm, or humerus) and hip fracture alone [9].

Several medications developed to treat osteoporosis, including denosumab, clodronate, romosozumab, and bazedoxifene [10–13], have been shown to be more effective in patients with higher, rather than lower pre-treatment fracture probabilities, although no apparent interactions between fracture probability and treatment efficacy were observed for other osteoporosis medication such as teriparatide, abaloparatide, raloxifene, and strontium ranelate [14–18]. Whether or not MHT is equally effective across the range of pre-treatment fracture probability as assessed by FRAX has not yet been investigated.

Assessment of falls risk has been demonstrated to improve fracture prediction in addition to other clinical risk factors and BMD in both men and women [19, 20]. Prior falls or other indicators for fall risk are not included in the currently used FRAX model [9], although the predictive value of FRAX probability for incident falls has been demonstrated in men [21]. In the Hip Intervention Program Study, the effect of oral risedronate in reducing fracture risk was not evident in older women included due to the presence of non-skeletal risk factors, primarily high falls risk [22]. Therefore, it can be argued that treatments, such as MHT, which increase BMD, may not be effective in preventing fractures in women at high risk of fracture due to increased falls risk. Identifying postmenopausal women with high fracture risk, either by calculating FRAX or investigating falls risk, would only be meaningful if the available interventions have a beneficial effect in lowering the increased risk.

The aim of the present study was to determine if MHT was equally effective in reducing fractures in postmenopausal women included in the two combined WHI trials, across the range of falls risk or fracture probability at the time of inclusion.

Methodsis

Participants

The present analysis is based on women included in the two WHI randomized controlled trials investigating either the effect of 0.625 mg/d of CEE vs. placebo ($n = 10{,}739$) or 0.625 mg/day of CEE and MPA 2.5 mg/day vs. placebo ($n = 16{,}608$). Eligibility criteria and recruitment methods have been described in detail previously [23–25]. In summary, healthy postmenopausal women, 50–79 years old at the time of inclusion, were recruited at 40 centers throughout the USA, starting in 1993. The present analysis was limited to the 25,389 women (93%) with available data on FRAX probabilities and previous falls. Women were followed for the duration of treatment, until July 9th, 2002, for the CEE + MPA trial or until February, 2004, for the CEE alone trial. The average follow-up time was 6.8 and 5.2 years for the CEE alone and the CEE + MPA trials, respectively [1, 2].

Fracture outcomes

Data regarding fractures during follow-up were collected using questionnaires administered at the semi-annual visits for all participants. All clinical fractures, other than fractures of the ribs, sternum, skull, face, fingers, toes, and cervical vertebrae, were adjudicated and verified using medical records at each participating clinical center. Hip fractures were also adjudicated centrally by trained physicians blinded to treatment allocation [1]. Major osteoporotic fracture (MOF) comprised fractures of the spine, hip, forearm, and proximal humerus [26]. For each respective fracture outcome, only the first fracture was counted.

Risk factors for fracture and previous falls

All women completed the WHI questionnaire at baseline to collect data regarding fracture history, medications, family history of hip fracture, past medical history (rheumatoid arthritis), high alcohol consumption (3 glasses of alcohol-containing drinks per day or more), and current smoking. Oral glucocorticoid treatment was recorded as use at least 3 times per week in the month prior to the baseline assessment. Previous fracture (yes/no) at baseline was recorded for all fractures after the age of 55 years. Apart from oral glucocorticoid use and rheumatoid arthritis (both FRAX input variables), secondary causes of osteoporosis were very rare and not considered and the "Secondary Osteoporosis" input variable for FRAX probability calculations was set to no for all study participants [20]. Information regarding the number of falls during the 12 months prior to the baseline visit was collected using a self-assessment questionnaire.

Statistical methods

This was an intention to treat (ITT) analysis. For the effects of MHT on fracture outcomes, an extension of the Poisson

regression model was used [27]. In contrast to logistic regression, the Poisson regression utilizes the length of each individual's follow-up period, and the hazard function is assumed to be exp (β0 + β1 · time from baseline + β2 · current age + β3 · current variable of interest). The observation period of each participant was divided in intervals of 1 month. One fracture per person was counted, and time to the first fracture or time at risk was censored at the time of first fracture, loss to follow-up, death, or end of follow-up. Deaths were ascertained from the National Death Index and reports from family members/physicians.

For the assessment of overall efficacy, the following regression model was used: (1) constant, (2) current time, (3) current age, (4) treatment (MHT versus placebo, where 1 = menopausal hormone therapy and 0 = placebo). The interaction between MHT and 10-year MOF probability was examined with the model: (1) constant, (2) current time, (3) current age, (4) treatment (MHT versus placebo), (5) 10-year probability, (6) treatment × 10-year probability.

Hazard ratios (HR) for treatment effect and 95% confidence intervals (95% CI) were computed as a continuous variable. For ease of presentation in tables, percent relative risk reduction (RRR = 100 − hazard ratio × 100) is shown for fracture outcomes and presented at the 10th, 25th, 50th, 75th, and 90th percentile of fracture probability for MOF. Models were adjusted for age and time since baseline and participation in the DM (Dietary Modification) trial and CAD (Calcium and Vitamin D) trial [23]. Two-sided *p* values were used for all analyses and $p < 0.05$ considered to be significant in all analyses except for analyses of interaction terms, for which *p* values < 0.10 were considered significant.

Results

The total follow-up period for all 25,389 women included was 4.3 ± 2.1 years (mean ± SD). The 12,650 women in the placebo group and the 12,739 women in the MHT group were very similar in baseline characteristics, including age, body mass index (BMI), proportion with prevalent fracture, fall prevalence, FRAX risk factors, and FRAX fracture probabilities (Table 1).

The incidences of any fracture, major osteoporotic fracture, and hip fracture were significantly lower in women randomized to MHT than in those receiving placebo. In a Poisson regression model, adjusted for age and time since baseline, MHT reduced the risk of any fracture (Relative risk reduction (RRR) 28% [95% confidence interval (CI) 22%, 35%]), major osteoporotic fracture (RRR 40% [95% CI, 31%, 47%]), and hip fracture (RRR 34% [95% CI, 4%, 55%]). These results were not affected by additional adjustments for participation in the inclusion in the Dietary Modification trial (DM) or the Calcium and Vitamin D trial (CAD) (Table 2).

The effect of MHT on fracture risk was then investigated in those with or without a fall during the last year. Similar RRRs in women on MHT vs. those on placebo were observed for any fracture, MOF in both fallers and no fallers, although the effect was not statistically significant for hip fracture in women without falls (Table 3).

The effect of MHT on the risk of all fracture outcomes was furthermore investigated according to the number of falls during the last year, as reported at baseline. MHT was associated with lower risk of all fracture outcomes, except

Table 1 Baseline characteristics of women randomized to menopausal hormone therapy or placebo treatment

	Placebo		Hormone therapy	
	n	*12,650*	*n*	*12,739*
Age, years (mean ± SD)	12 650	63.5 (7.2)	12 739	63.5 (7.2)
BMI, kg/m^2(mean ± SD)	12 560	29.1 (6.1)	12 674	29.1 (6.1)
Prevalent fracture, *n* (%)	10 033	1665 (16.6)	10 080	1702 (16.9)
Family history of hip fracture, *n* (%)	12 305	1641 (13.3)	12 400	1605 (12.9)
Current smoking, *n* (%)	12 497	1318 (10.5)	12 609	1311 (10.4)
Oral corticosteroid use, *n* (%)	12 650	6 (0.0)	12 739	7 (0.0)
Reumatoid arthritis, *n* (%)	12 387	623 (5.0)	12 459	669 (5.4)
High alcohol intake[B], *n* (%)	12 610	538 (4.3)	12 698	534 (4.2)
FRAX MOF, % (mean ± SD)	12 650	10.0 (6.8)	12 739	10.0 (6.7)
FRAX hip fracture, % (mean ± SD)	12 650	2.2 (3.6)	12 739	2.2 (3.5)
Fall prevalence[A], *n* (%)	12 650	4250 (33.6)	12 739	4271 (33.5)
Prior falls[A], *n* (%)				
No falls		8400 (66.4)		8468 (66.5)
1 fall		2569 (20.3)		2618 (20.6)
2 falls		1123 (8.9)		1073 (8.4)
3 or more falls		558 (4.4)		580 (4.6)

[A]Falls within 12 months prior to baseline. [B]3 or more glasses of alcohol-containing drinks per day

Table 2 Effects of menopausal hormone therapy vs. placebo on fracture outcomes

	Placebo $n = 12{,}650$	Menopausal hormone therapy $n = 12{,}739$
Any fracture		
No. (%)	1075 (8.5)	765 (6.0)
Rate per 1000 person-years	20.8	14.7
Time at risk, mean (SD), years	4.1 (2.1)	4.1 (2.2)
HR (95% CI)	1 [Reference]	**0.72 [0.65, 0.78]**
HR (95% CI) adjusted for DM and CAD	1 [Reference]	**0.72 [0.65, 0.78]**
Relative risk reduction (%)	0 [Reference]	**28 [22, 35]**
Major osteoporotic fracture		
No. (%)	591 (4.7)	350 (2.7)
Rate per 1000 person-years	11.2	6.6
Time at risk, mean (SD), years	4.2 (2.1)	4.2 (2.2)
HR (95% CI)	1 [Reference]	**0.60 [0.53, 0.69]**
HR (95% CI) adjusted for DM and CAD	1 [Reference]	**0.60 [0.53, 0.69]**
Relative risk reduction (%)	0 [Reference]	**40 [31, 47]**
Hip fracture		
No. (%)	71 (0.6)	44 (0.3)
Rate per 1000 person-years	1.3	0.8
Time at risk, mean (SD), years	4.3 (2.1)	4.2 (2.2)
HR (95% CI)	1 [Reference]	**0.66 [0.45, 0.96]**
HR (95% CI) adjusted for DM and CAD	1 [Reference]	**0.66 [0.45, 0.96]**
Relative risk reduction (%)	0 [Reference]	**34 [4, 55]**

Number of fractures, rate per 1000 person-years, time at risk, hazard ratios (HR), and relative risk reductions (%) with 95% confidence intervals are shown for overall treatment effect of menopausal hormone therapy (1) adjusted for age and time since baseline, and (2) adjusted for DM (Dietary Modification trial) and CAD (Calcium and Vitamin D trial). Significant ($p < 0.05$) HRs are presented in bold

hip fractures in those without falls, those with 1 prior fall, and within those with 2 prior falls (Table 4). The lower risk of hip fracture in those treated with MHT was only significant in those with 2 prior falls, but the analysis was limited by the small number of hip fractures across subgroups (Table 4). There was no interaction between MHT and prior falls for any fracture outcome ($p = 0.24$ for hip fracture and $p > 0.30$ for all other outcomes).

Treatment was effective in reducing the risk of any clinical fracture (Fig. 1 and Table 5), MOF, and hip fracture in women regardless of baseline FRAX MOF probability, with no evidence of an interaction between HT and FRAX ($p > 0.30$ for the interaction term for all fracture outcomes).

A sub-analysis was performed to investigate the effect of MHT on the risk of any fracture in women under 60 years of age. This analysis included 4031 women with MHT and 4037 women given placebo. The groups had very similar baseline characteristics (Supplemental Table 1). MHT reduced the risk of any fracture (RRR 24% [95% CI, 8%, 37%]) with no evidence of an interaction between MHT effect and FRAX MOF baseline probability ($p > 0.30$; Supplemental Table 2).

Discussion

The present analyses indicate that MHT is effective in reducing fracture risk regardless of pre-treatment fracture probability as estimated by FRAX and history of falls in healthy postmenopausal women. No interactions between treatment efficacy and fracture probability or prior falls were observed for any fracture outcome. Thus, the observed robust fracture risk reductions amounting to 28% for any fracture and 34% for hip fracture with MHT can be anticipated across the range of baseline FRAX fracture probabilities. Our results are consistent with previous analyses of each trial alone where estrogen alone and estrogen + progesterone were shown to reduce fractures irrespective of the number of previous falls and the underlying fracture probability estimated using the Study of Osteoporotic Fractures score [3, 28]. Importantly, our findings extend these previous results by combining the 2 trials and improving statistical power to investigate any potential interaction with falls and fracture probability, having sufficient statistical power to investigate also hip fracture outcomes, and by using the well-established fracture risk algorithm, FRAX, that has been widely

Table 3 Effect of menopausal hormone therapy vs. placebo on fracture outcomes in fallers and no fallers

	Within no fallers $n=16,868$	Within fallers $n=8521$
Any fracture		
No. (%)	1121 (6.6%)	719 (8.4%)
Hazard Ratio, 95% CI	**0.70 [0.62, 0.79]**	**0.74 [0.63, 0.85]**
Relative risk reduction (%), 95% CI	**30 [21, 38]**	**26 [15, 37]**
Major osteoporotic fracture		
No. (%)	585 (3.5%)	356 (4.2%)
Hazard Ratio, 95% CI	**0.62 [0.53, 0.73]**	**0.57 [0.46, 0.70]**
Relative risk reduction (%), 95% CI	**38 [27, 47]**	**43 [30, 54]**
Hip fracture		
No. (%)	65 (0.4%)	50 (0.6%)
Hazard Ratio, 95% CI	0.80 [0.49, 1.31]	**0.51 [0.28, 0.92]**
Relative risk reduction (%), 95% CI	20 [-31, 51]	**49 [8, 72]**

Hazard ratios (HR) and relative risk reductions (RRR) with 95% confidence intervals are shown for overall treatment effect of hormone therapy adjusted for DM (Dietary Modification trial) and CAD (Calcium and Vitamin D trial). Significant ($p<0.05$) HRs and RRRs are presented in bold

incorporated and used in over 80 guidelines worldwide [29]. Thus, these findings provide additional support for MHT use in women with varying falls risk and across a wide spectrum of fracture risk, assessed with the nowadays widely used FRAX tool.

Based on that, the 10-year fracture probability of MOF in the placebo group at baseline was 10% and the observed incidence during the 4.3 years of follow-up was 4.7%, indicating that the FRAX model was well calibrated for the investigated population.

Risedronate was not effective in preventing fractures in women selected based on non-skeletal risk factors, such as high falls risk [22]. It has therefore been questioned if osteoporosis drugs should be considered in women with high fracture risk based on non-skeletal risk factors. An analysis from the CEE + MPA WHI trial revealed that MHT was equally effective in those who reported falls and those who did not within the 12 months preceding study start, without any significant interaction [3]. These data are in agreement with the previously reported lack of interaction between falls and anti-fracture efficacy of clodronate [30]. In the CEE alone trial, there was no interaction between previous falls and MHT effect for total fracture and hip fracture, although it should be emphasized that the number of hip fractures was limited (44 and 68 in the CEE and placebo groups, respectively) and the p value for interaction 0.15 [31]. The present study utilizing both WHI MHT trials confirms the lack of interaction between MHT and previous falls history on the reduction of fracture risk, a finding consistent for all fracture outcomes. Thus, also women identified to have a high risk of falls benefit in terms of fracture risk reduction with MHT.

Menopausal hormone therapy is currently primarily recommended to women younger than 60 years old or within 10 years of menopause, to relieve menopausal symptoms and improve quality of life, if the risk-to-benefit balance is favorable [5, 32]. In the herein presented analysis, we found that MHT was effective in reducing the risk of any fracture, regardless of baseline FRAX MOF probability in women under 60 years of age, further supporting this recommendation.

In a recently published position paper from the European Society for the Clinical and Economic Aspects of Osteoporosis, Osteoarthritis and Musculoskeletal Diseases (ESCEO) and the International Osteoporosis Foundation (IOF), a strategy on how to stratify treatment according to efficacy, costs and adverse events risk, in relation to fracture risk was proposed. It was suggested that in postmenopausal women with *very* high fracture risk, including, e.g., older women with a vertebral fracture, an anabolic agent should be considered prior to an antiresorptive, such as a bisphosphonate or denosumab. In women with a high fracture risk, an antiresorptive should be considered as first-line of choice [33]. It was furthermore proposed

Table 4 Effect of menopausal hormone therapy vs. placebo on fracture outcomes according to number of falls

	Effect of hormone therapy			
	Within no fallers	Within those with 1 fall	Within those with 2 falls	Within those with ≥ 3 falls
	$N=16,868$	$N=5187$	$N=2196$	$N=1138$
Any fracture	**0.70 [0.62, 0.79]**	**0.81 [0.66, 0.99]**	**0.60 [0.46, 0.80]**	0.72 [0.50, 1.04]
Major osteoporotic fracture	**0.62 [0.53, 0.73]**	**0.66 [0.49, 0.89]**	**0.53 [0.36, 0.80]**	**0.39 [0.22, 0.68]**
Hip fracture	0.80 [0.49, 1.31]	0.82 [0.37, 1.86]	**0.36 [0.14, 0.92]**	–

Hazard ratios with 95% confidence intervals, adjusted for age, time since baseline, DM (Dietary Modification trial) and CAD (Calcium and Vitamin D trial) are presented. Significant ($p<0.05$) HRs are presented in bold

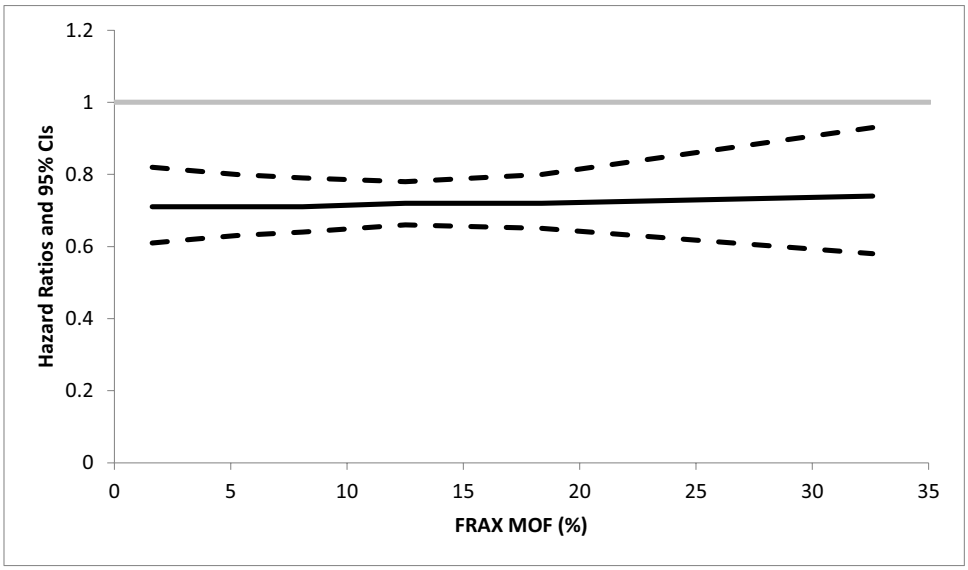

Fig. 1 Effect of menopausal hormone therapy on risk of any fracture according to baseline FRAX major osteoporotic fracture probability

Table 5 Effect of MHT vs. placebo on the risk of any fracture according to FRAX MOF baseline fracture probability

Percentile of baseline FRAX score MOF	Baseline FRAX score MOF	RRR
10	3.37	**29% (19, 38%)**
25	5.25	**29% (20, 37%)**
50	8.09	**29% (21, 36%)**
75	12.51	**28% (22, 34%)**
90	18.37	**28% (20, 35%)**

Relative risk reductions (RRR, %) with 95% confidence intervals are shown for overall treatment effect of menopausal hormone therapy (1) adjusted for age and time since baseline. *p* value for the interaction term > 0.30

that younger postmenopausal women with a low fracture risk could still have a high lifetime probability of fracture and would therefore be candidates for MHT, thus delaying or preventing their transition to a higher risk group, as a result of aging and declining BMD [34]. Our present analysis, demonstrating that MHT is effective in preventing fractures also in those with low baseline fracture probability according to FRAX, supports the proposed treatment stratification.

The herein presented results are in contrast to the large clinical trials with denosumab, clodronate, or bazedoxifene, in which treatment efficacy was greater in postmenopausal women with higher as opposed to those with lower fracture risk [10–12]. Important differences between these studies and the WHI trials include a higher baseline fracture probability in the former trials because they were limited to women with osteoporosis as defined by a prevalent vertebral fracture or low BMD (bazedoxifene and denosumab trials). In the WHI trials, MHT reduced fracture risk in women unselected for low BMD, refuting the need for a BMD assessment prior to MHT start in treatment candidates. Both the clodronate and WHI trials recruited postmenopausal women without requirement for risk factors for osteoporosis and fracture, but women were generally older and had higher FRAX fracture probability in the clodronate trial than in the WHI studies, which could also have contributed to the discrepancies regarding observed interactions between fracture probability and treatment efficacy.

Estrogen deficiency leads to increased bone loss, due to increased bone resorption via osteoclast recruitment and activity, and conversely MHT results in increased BMD in postmenopausal women who have low estrogen levels [3, 35]. It has recently been shown that changes in BMD can explain a considerable proportion of the anti-fracture efficacy seen with osteoporosis medications, including MHT [36], but other factors such as effects on bone turnover, may also contribute[35]. A subgroup analysis from the WHI intervention studies has failed to observe a positive effect of MHT on lean mass, measured with dual x-ray absorptiometry (DXA), and on fall risk [37]. Combined, these data indicate that the anti-fracture efficacy of MHT observed here, is primarily due to an effect on BMD and not on fall risk.

The current study has several limitations. The analyses of MHT efficacy on fracture risk according to pre-treatment history of falls and fracture probability were not prespecified. Furthermore, subgroup analysis limits the statistical power which could give rise to false results, driven by multiple comparisons and chance. However, all trial participants were included in the analysis of the interaction between MHT efficacy and fracture probability, and the subgroups of fallers and no fallers were quite large (with over 8500 women in the smallest group), and with the exception of hip fracture, many fracture outcomes were available in each group. It should though be noted that

the analysis within fallers, divided according to the number of falls, was based on much smaller groups with fewer outcomes implying that the results should be interpreted with caution. Although combining the two WHI trials resulted in a very large study cohort and increased the statistical power, combining trials of slightly different treatment regimens in one analysis could have resulted in heterogeneity in results. Even though it is unlikely to affect the interaction analysis with FRAX, it should be acknowledged that FRAX estimates fracture probability over 10 years but the observation time in the current trial was only 4.3 years on average. In addition, the FRAX variable secondary osteoporosis, which is not a major contributing variable, was not considered, which affected the calculated FRAX probabilities, probably only to a small degree, supported by the agreement found between the observed incidence and FRAX probabilities for major osteoporotic fracture. Lastly, although fractures often occur in association with falls, a history of falls was assessed at baseline. The very large combined study cohort and the treatment efficacy being evaluated in a randomized controlled setting constitute substantial strengths of the current study. It is also the first study investigating if the effect of MHT on fracture risk is dependent on fracture probability according to FRAX at the time of MHT initiation.

In conclusion, using the combined WHI trials, MHT reduces fracture risk compared to placebo, regardless of baseline FRAX probability and falls history in postmenopausal women.

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Declarations

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